the OIL AND GAS JOURNAL

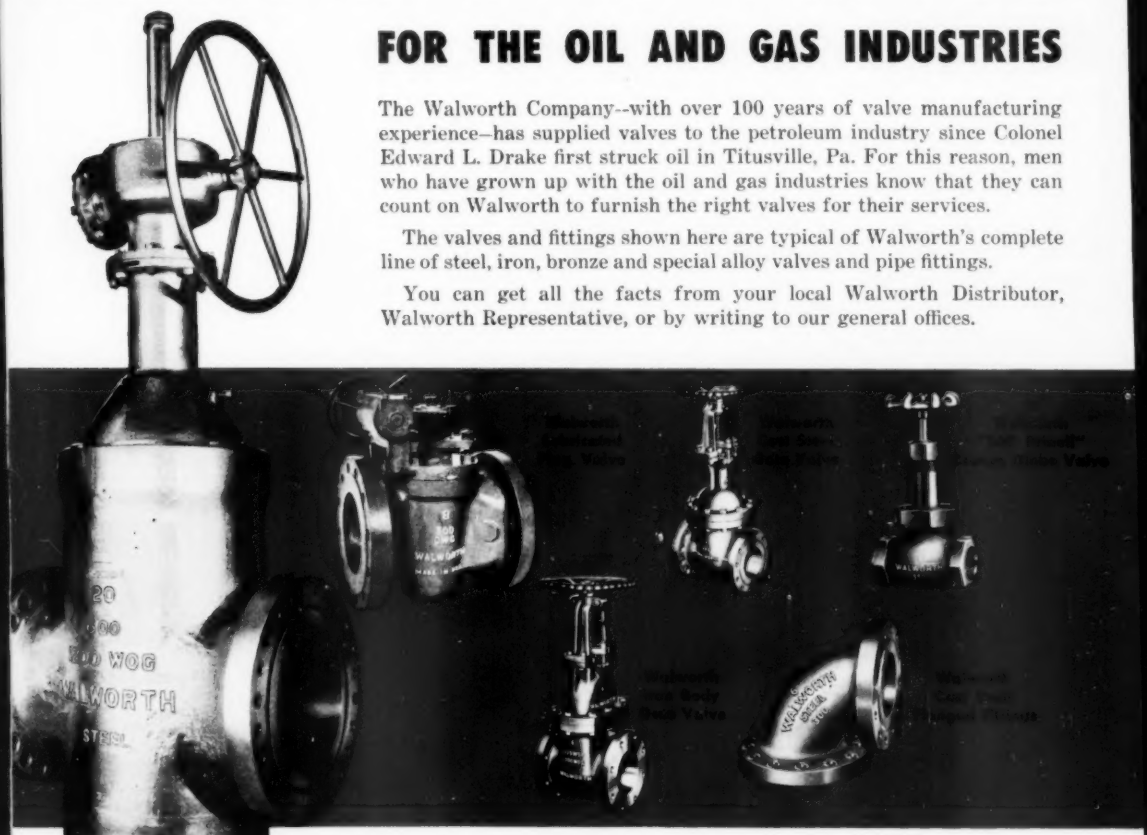
WALWORTH valves

FOR THE OIL AND GAS INDUSTRIES

The Walworth Company--with over 100 years of valve manufacturing experience–has supplied valves to the petroleum industry since Colonel Edward L. Drake first struck oil in Titusville, Pa. For this reason, men who have grown up with the oil and gas industries know that they can count on Walworth to furnish the right valves for their services.

The valves and fittings shown here are typical of Walworth's complete line of steel, iron, bronze and special alloy valves and pipe fittings.

You can get all the facts from your local Walworth Distributor, Walworth Representative, or by writing to our general offices.



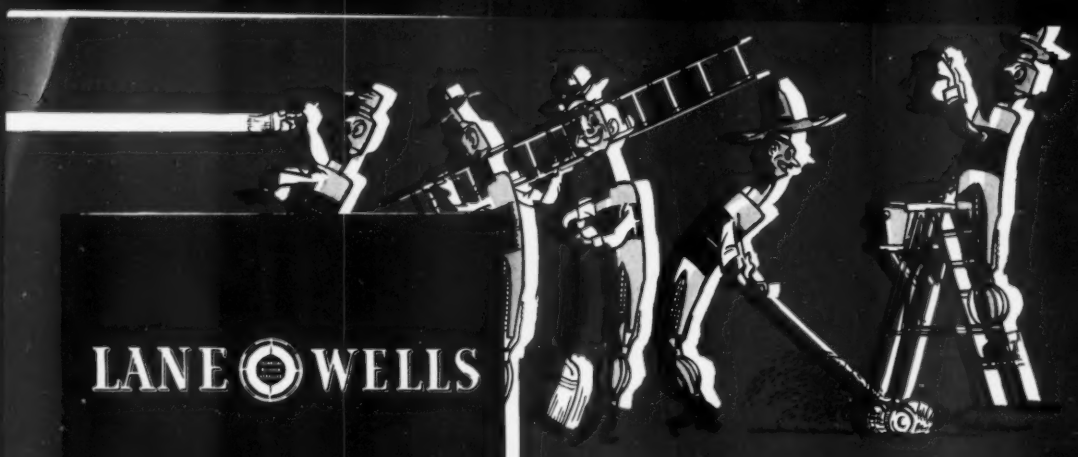
Walworth
Type 49 Cast
Steel Pipe Line
Gate Valve

WALWORTH

valves • fittings • pipe wrenches

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD



LANE WELLS

Engineered

PACKER SERVICE

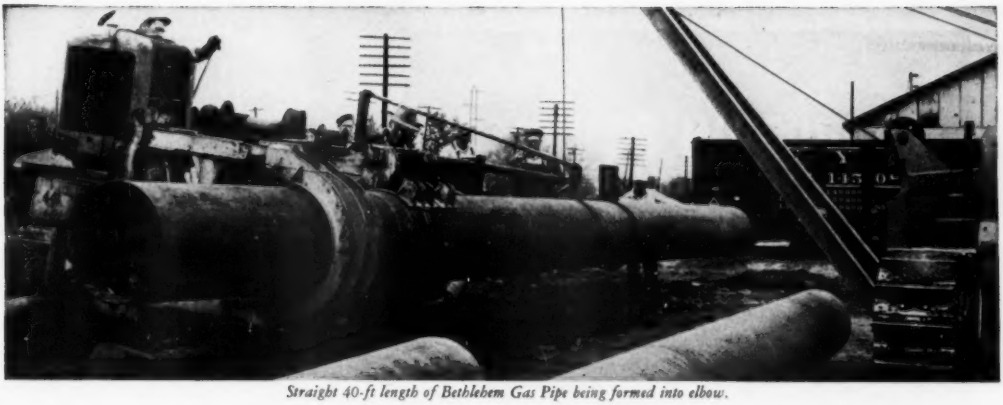
can show you how to get more work from your packers!

All kidding aside, you *can* get greater service from your packers by using the aid offered by Lane-Wells Engineered Packer Service. For this free service can help you plan packer setups with top efficiency for the given job, aid you in selecting just the right packer or packers for the set-up, and work out with you packer setting and packer pulling programs which do the job efficiently, safely, and with minimum strain on equipment. When you add to this the advice on packer maintenance and packer efficiency which is also available, it's easy to see *why*

Engineered Packer Service can help you get more work out of your packers.

Ask Your Lane-Wells Man!

Tomorrow's Tools — Today!



Straight 40-ft length of Bethlehem Gas Pipe being formed into elbow.

New Gas Line in Southwest Illinois

To better its facilities for supplying gas to consumers in the Alton, Ill., area, the Mississippi River Fuel Corp., St. Louis, recently installed a 12-mile feeder line. Shown under construction in the accompanying photographs, the new gas line originates at an existing line near Granite City and extends to Wood River, Ill. It is built of 24 in. Bethlehem Gas Pipe. Field joints were made by welding.

Bethlehem Oil and Gas Pipe is the ideal pipe for distribution lines. It is a superior pipe in every way, and can be made to meet the requirements of any of these three specifications—API 5Lx42, ASTM A-139, and ASTM A-134. You can count on it for dependable performance, free from blowouts.

Bethlehem Oil and Gas Pipe is made in 40-ft lengths, with beveled or straight ends, and in all practical diameters, starting with a minimum of 22 in. i.d. In diameters up to 36 in., the pipe has one longitudinal and one girth seam. Larger sizes have two longitudinal seams. Our facilities include grit-blasting, priming, enameling and wrapping. We also have equipment for the manufacture of tees, crosses, and other fittings.

If you would like additional information about Bethlehem Oil and Gas Pipe, contact the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Welder makes field girth seam. Note accurate alignment of horizontal seams.

Combat Vibration With Pipe Made of Mayari R

If you encounter an installation where vibration is a serious factor, use Mayari R, Bethlehem's low-alloy, high-strength steel. Mayari R resists shock, has a yield point of 50,000 psi min, and an endurance limit of 50,000 psi. It is ideal for use near compressor stations and other special locations.

BETHLEHEM STEEL

BETHLEHEM OIL AND GAS PIPE

CORROSION CRIPPLES-
MORE WAYS THAN ONE

Valuable products as well as vital equipment are threatened

Corrosion takes its toll in more ways than one—it runs away costly, hard-to-get equipment—wastes manufacturing plant's production facilities—and causes loss of valuable finished products through contamination.

Fortunately, nearly all forms of corrosion in some degree, and much of this waste can be avoided by taking these steps:

1. Coat all manufacturing equipment, storage tanks, and other items exposed to corrosive fumes, acids, alkalies, or moisture.

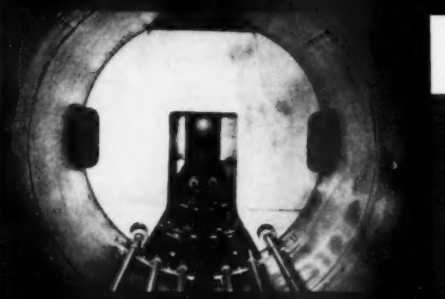
2. Arrange to protect them with AMERCOAT — the corrosion resistant coatings, each built to conquer specific industrial corrosion problems.

Manufacturers in nearly every industry have found that it pays to protect — protect with AMERCOAT.

AMERCOAT CORPORATION

FOLLOW THE LINE OF *most* RESISTANCE

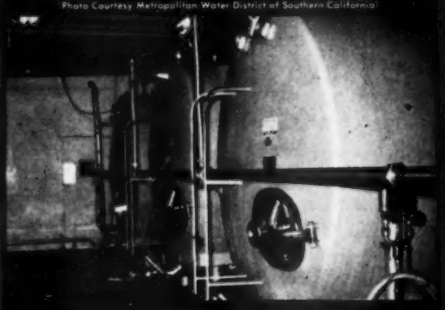
2-51-I



CHEMICAL PLANTS — Caustic Soda Tank

PETROLEUM REFINING — Columns and Piping

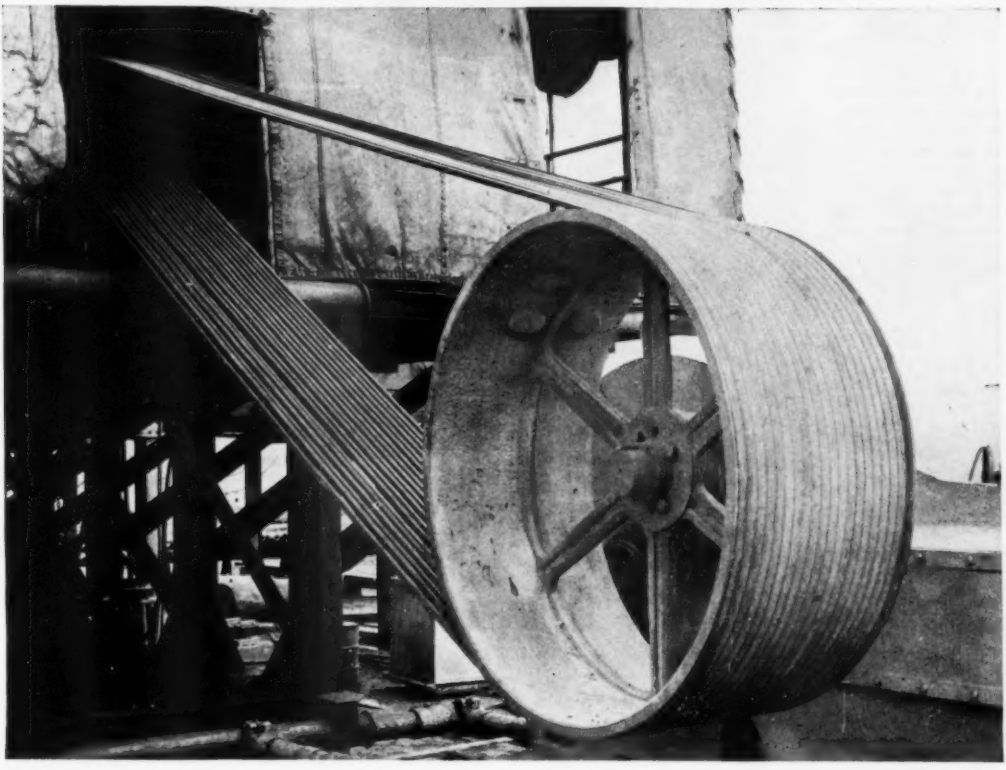
WATER SOFTENING PLANT
Photo Courtesy Metropolitan Water District of Southern California



FOOD PROCESSING — Milk Storage Tanks

TEXTILE MILLS — Dyeing and Finishing

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Here B. F. Goodrich grommet belts are saving $104.50 a month

B. F. Goodrich grommet V belts cut costs 20 to 50%

THESE 18 V belts are needed to drive heavy pumps for drilling oil wells. The belts have to operate 24 hours a day, 7 days a week, in all sorts of weather. Ordinary belts couldn't stand the heavy pulling load, couldn't take the strain of round-the-clock operation. They averaged 9 months' life in this kind of service.

Then B. F. Goodrich grommet belts were tried. After 19 months, and drilling wells totaling 76,000 feet deep, these grommet belts look as good today as the day they were installed. Here's why B. F. Goodrich grommet belts can be counted on to save on belt costs:

No cord ends — A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength — All of the cord material in a B. F. Goodrich grommet multiple-V belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. No layers of cords to rub against one another and generate heat; cord and adhesion failures are reduced.

Better grip, less slip — Because a grommet is endless, a grommet V belt is more flexible, grips the pulleys better. Size for size, grommet multiple-V belts will give ⅓ more gripping power, pull heavier loads with a higher safety factor.

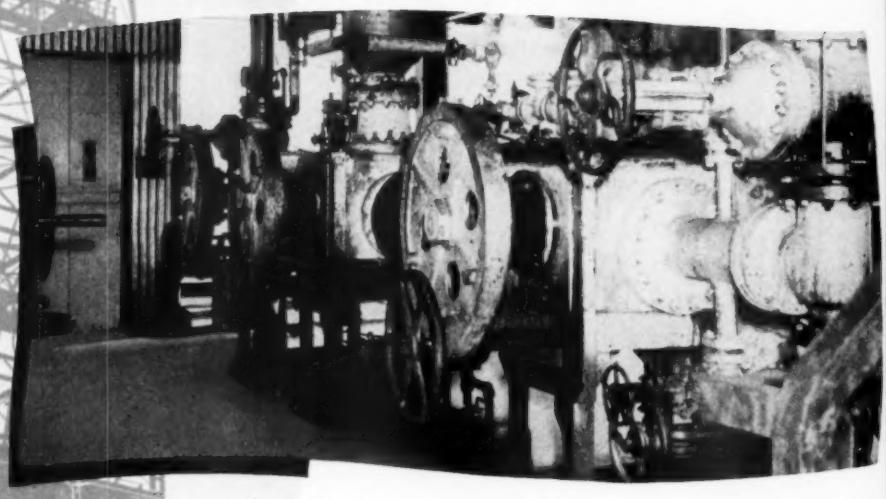
Only B. F. Goodrich has the grommet!—No other multiple-V belt is a grommet V belt (U. S. Patent No. 2,233,294). Now available in C, D and E sections. See your local B. F. Goodrich distributor. *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

RUBBER FOR INDUSTRY

Wilson-Snyder Switch Valves



• The master Switch Valve in the center has one inlet and three outlets. Valves on each side have one inlet and two outlets and each one serves a coke drum. This combination readily controls the continuous flow of the charge from the coke furnace.

—distribute reduced crude to the coke drums in PAN-AM SOUTHERN'S El Dorado Refinery new coking unit.

THE Delayed Coking Unit of Pan-Am Southern Corp. which recently went on stream, is one of the largest installations of its type and incorporates the latest developments in coking operations.

Three 10-inch Wilson-Snyder Series 300 Switch Valves, control the flow from coking furnace to coke drums of 9,300 bs/d of corrosive (high sulphur content) reduced crude at approximately 900°F. The charge produces 1,950 bbl. of depropanized 400° E.P. gasoline, 5,240 bbl. of gas oil for catalytic cracking and 420 tons of coke daily.

Wilson-Snyder Switch Valves are designed for switching continuous flows of hot liquids or vapors from one processing chamber to another without interrupting the rate of flow. They are made to order with any inlet-outlet combination required by your application—in forgings which range from carbon to stainless steels. They are particularly suitable for coking hook-ups because of their positive provision for quick breakage of coke seals.

Your Local "Oilwell" Representative will process your inquiry and give you detailed recommendations.

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USS TRADE MARK

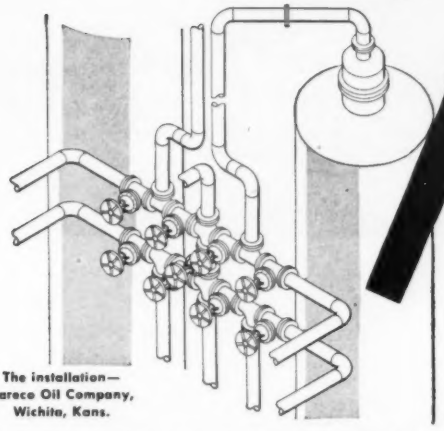
"OILWELL" TRADE MARK

UNITED STATES STEEL

for outstanding service

on Gasoline Desulfurization

...for example



The installation—
Barsco Oil Company,
Wichita, Kans.

PROBLEM: To select valves that would stay absolutely tight on hot gasoline, steam-air mixture, and catalyst regeneration waste gases, for control manifold to reaction chambers on Perco Cycloversion unit.

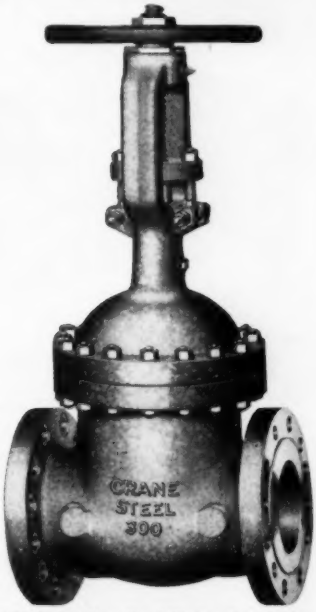
WORKING CONDITIONS: Cyclic operation; approximately 15-day cycles. At oil inlet, straightrun gasoline handled at 950 Deg. F., 85 psi. For catalyst regeneration, air-steam mixture at 850 Deg. F., 15 psi. Regeneration waste gases, 1200 Deg. F., 5 psi.

SOLUTION TO PROBLEM: Crane 8-inch, 300-Pound, No. 5 Chrome-Molybdenum Alloy Steel Wedge Gate Valves, with Stellite seats and patented flexible disc design.

RESULTS: After more than 2 years' service, all Crane valves are absolutely tight and operating at highest efficiency, with no maintenance.

ANOTHER TYPICAL CASE HISTORY, demonstrating the low ultimate cost of Crane Valves of every type. And the reason why...
More Crane Valves are used than any other make!

...Equip with Dependable Quality CRANE VALVES



300-Pound Cast Steel Wedge Gate Valve. In body and trim materials for all refinery services. See your Crane Catalog.

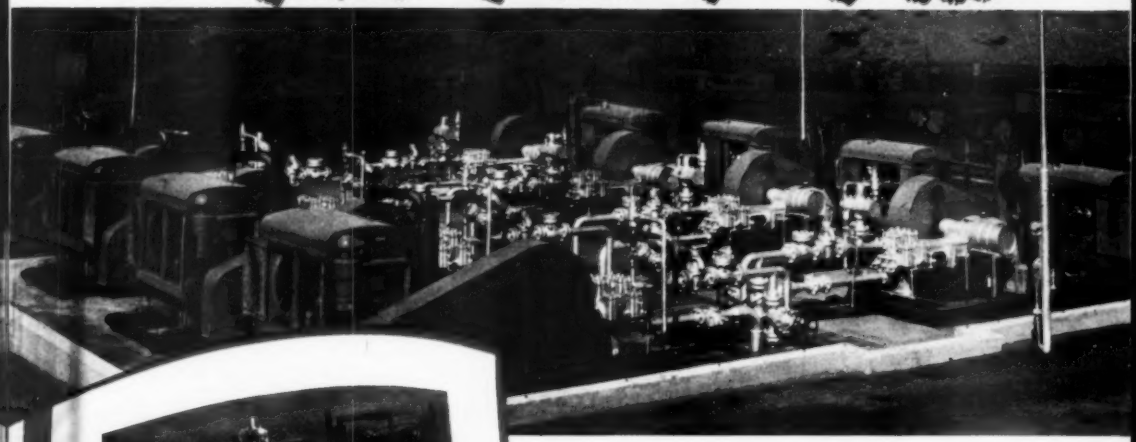
CRANE CO.

General Offices:
836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910. at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1951.

We help to feed RICHFIELD's $7,000,000 Baby



BIG pipe lines like Richfield's, once laid, become fixed and permanent installations. It is the feeder lines that provide flexibility and expansibility, and that's where Gaso Pumps come into the picture.

They help to feed main lines by powering the auxiliary lines that reach out into tank farms, field storage and other source-points of oil.

Used singly or in batteries, Gaso Pumps are adaptable to any requirements. Their portability permits transfer when necessary to meet changed conditions. And their performance record assures the kind of service realistic pipe line engineers look for.

GASO PUMP & BURNER MFG. CO.

902 EAST FIRST ST., TULSA, OKLA.

EXPORT OFFICE: 149 BROADWAY, NEW YORK

Shreveport: W. L. Somner Co., 419 Lake Street

Los Angeles: 2529 Chambers St., Vernon

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GASO PUMPS

for every oil industry need

Tank farm of the Cit-Con Oil Corporation refinery near Lake Charles, Louisiana. Here, for the first time, air is being dried by ALCOA *Activated* Alumina and passed over the surface of lube oils to prevent the entry of outside moisture which might contaminate the products.

Another first for ALCOA *Activated* Alumina:

Protecting Finished Oils from Water Contamination

Charged with ALCOA *Activated* Alumina, this is one of eight dehumidifiers serving dry air to 17 tanks with a combined capacity of 460,000 bbl. Units were designed to handle 350 SCFM dried to 74° F. dew point at ⅜" water column, with inlet air at atmospheric pressure and 86° F. Quality control tests have found no moisture in the finished oils since the dryers first went into operation in 1949.

Not only at Cit-Con, but throughout the petroleum industry, ALCOA *Activated* Alumina is improving processes and speeding up production in a number of ways. Commercially pure, it is one of the few solid adsorbents that does not change its form or properties. It will not swell, soften or disintegrate, is non-corrosive and practically iron-free.

Whatever your drying problem, it will pay you to investigate ALCOA *Activated* Alumina. Its versatility and reputation as a dependable, economical drying agent are ready to go to work for you. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 618 L Gulf Building, Pittsburgh 19, Pennsylvania.

Alcoa Chemicals

ALCOA

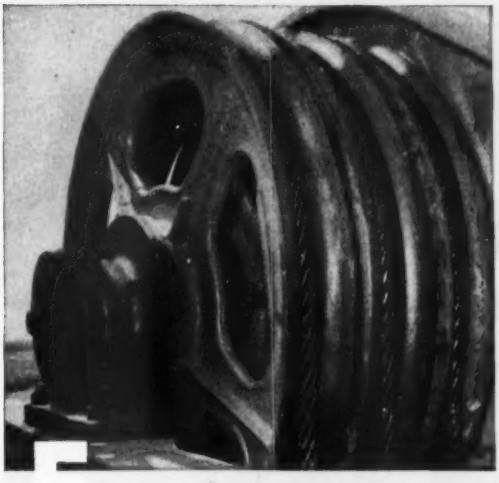
ALUMINAS and FLUORIDES

ACTIVATED ALUMINAS • CALCINED ALUMINAS • HYDRATED ALUMINAS • TABULAR ALUMINAS • LOW SODA ALUMINAS ALUMINUM FLUORIDE • SODIUM FLUORIDE • SODIUM ACID FLUORIDE • FLUOBORIC ACID • CRYOLITE • GALLIUM

Six ways to put more life

Don't use a line that's too small. It will wear out faster and cost you more per ton mile than the correct size of line. For deep drilling the 1¼" line is common and some drillers are trying 1⅜" lines with good success.

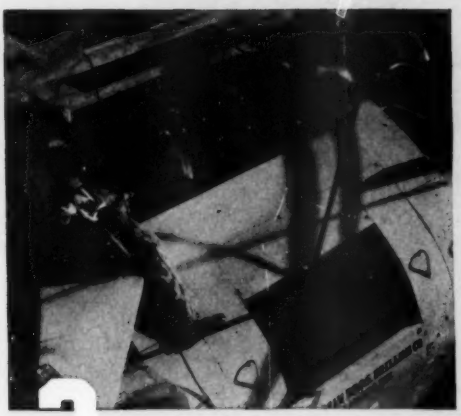
Use a line that's long enough for a few cut backs. Wear and fatigue are usually most severe at certain points. The removal of short lengths distributes these destructive forces over different sections of the line and results in much longer service.



Avoid badly worn sheaves. Smooth sheaves with full-sized grooves increase wire line life.

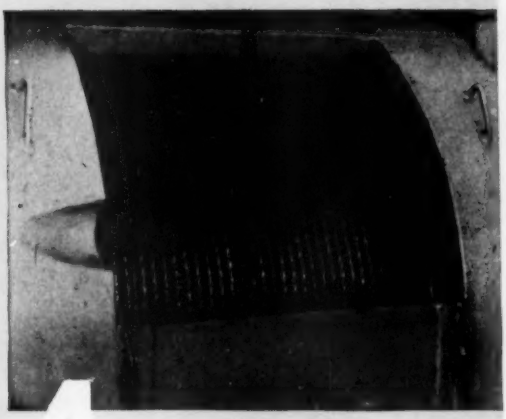
Don't speed. It causes excessive vibration and danger of cross winding on drums.

into your wire lines



3

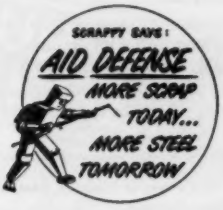
Reverse the ends. Wear from sheaves and fatigue from vibration can be distributed more evenly by turning the line end for end.



4

Don't neglect lubrication. We shouldn't have to remind an oil man about lack of lubrication, but this is still a common cause of wire line failure. A 6 x 19 wire line has 115 moving parts—each sliding on the others. If you think of a wire line as a machine—like your automobile—you will lubricate it more often. American TIGER BRAND Lines come from the factory thoroughly lubricated with "Tiger-Lube," the finest wire line lubricant available. But even this dissipates in time and the wire line needs to be relubricated before it is too late.

In spite of all these "pitfalls" a reasonable amount of care and maintenance will assure long service life from your TIGER BRAND Lines. They are made of the toughest steels and are properly built to do the job for which they are designed and intended.



AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

AMERICAN TIGER BRAND WIRE LINES

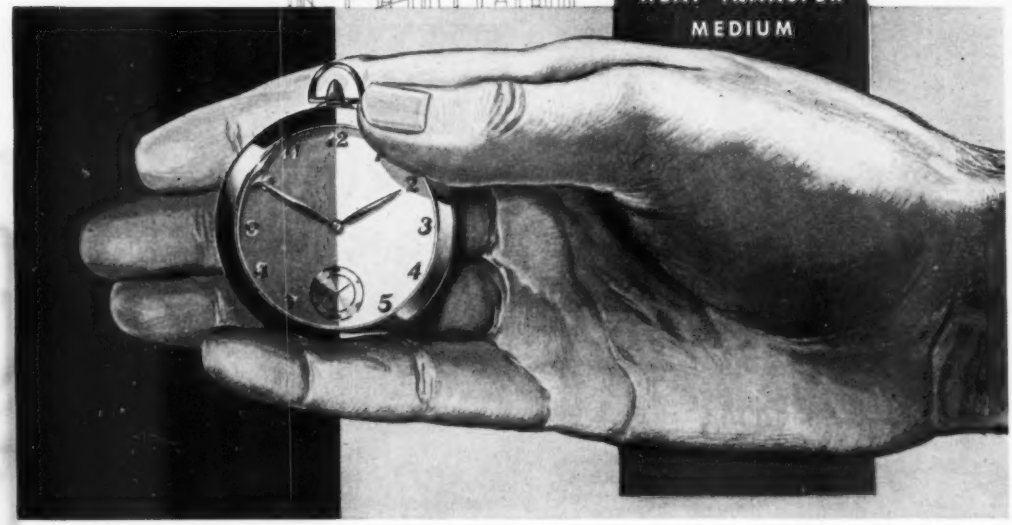
Excellay Preformed

UNITED STATES STEEL

on the job 24 hours a day

DOWTHERM

the
MODERN
HEAT TRANSFER
MEDIUM



FOR DEPENDABLE HEAT IN PROCESSING OPERATIONS

DOWTHERM® is your most dependable heat transfer medium! DOWTHERM permits you to have accurate, high temperatures for the complete recovery of many petroleum fractions. At temperatures ranging from 300°F. to 750°F., a DOWTHERM system can be operated at *exceedingly low pressures.* Less equipment is required because of the higher heat transfer coefficient of DOWTHERM.

Important, too, a system using DOWTHERM can be operated with a minimum of maintenance. With non-fouling properties, DOWTHERM eliminates forced shut-downs of your heat processing equipment. Also, coking of the heated stream may be minimized with the use of DOWTHERM. And, when alternate heating and cooling are required, DOWTHERM can be used in the same equipment. For complete dependability in your heat process equipment . . . investigate DOWTHERM. Write Dow today for complete information.

Attention Process Men . . . Use DOWTHERM

. . . for concentrating sulfuric acid.

. . . for selective catalytic polymerization in the production of iso-octane.

. . . For all processes requiring heat at 300°F. to 750°F.

THE DOW CHEMICAL COMPANY
Midland, Michigan

The Dow Chemical Company, Dept. DO-26
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City_____ **State**_____

DOW
CHEMICALS

MURPHY DIESEL...

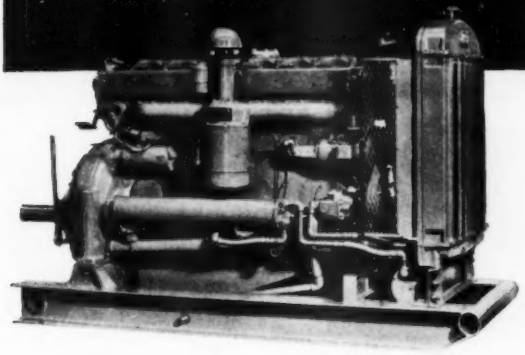
gives you easier starting . . .

more economy . . . smoother

operation . . . better response

***because it has* UNIT FUEL INJECTION**

Another Murphy powered rig about ready to get under way. This one is owned by Carl U. Perry, Drilling Contractor, Freeport, Texas.



The performance of a diesel engine can be no better than the accuracy of control of fuel injection. That's why we say the unit injector is the heart of the Murphy Diesel. This simple, self-contained unit is both pump and nozzle. There are no high pressure fuel lines to interfere with smooth, accurate, precisely controlled fuel injection and rob you of power and fuel. In the Murphy Diesel, solid fuel completely atomized as a fine fog is injected directly into all parts of a plain, open combustion chamber. Ignition is accomplished solely by the heat of compression of the air within the cylinder. The precisely controlled rate of injection determines the speed and pressure of combustion, hence the power delivered and the amount of fuel used.

Translated into benefits for the user, Murphy Unit Fuel Injection makes possible greater power output with less fuel—better all around performance. Full details are given in the booklet *"10 Questions to Ask a Diesel Engine Salesman"*. Ask your Murphy Diesel Dealer for a copy or write direct.

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5305 W. Burnham St., Milwaukee 14, Wisconsin
TULSA OFFICE—Sales, Parts, Service:
113-117 South Elwood Street, Tulsa, Oklahoma

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MURPHY DIESEL

215

Heavy duty power
for the oilfields

Murphy Diesel Engines and Power Units for drilling and pipe line pumping, 90 to 226 H.P., 1200 and 1400 RPM. Generator Sets, 60 to 140 K.W. Dual-Fuel Engines, 135 to 180 H.P. Also Crude Oil Burning Engines.

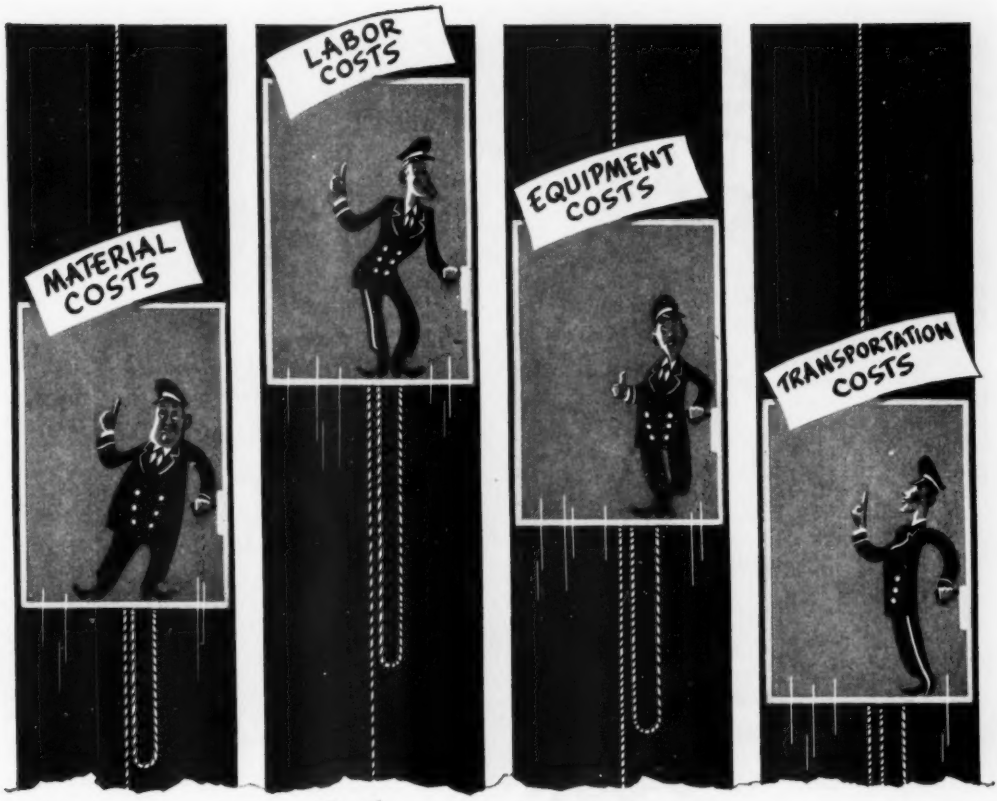
HELPING AMERICA BUILD FASTER

Steel speed-up gets aid from Beechcrafts

With steel production at a better-than-100% capacity, there's an even greater premium on executive *time*. This is why company-owned Beechcrafts serve leading steel companies daily—cutting travel time as much as 75%! Executives know complete mobility, give distant problems on-the-spot attention.

Wherever business is helping America build faster, you find Beechcrafts on the job. The two goals of defense production plus a healthy economy demand higher efficiency. Discover how you get more done—by Beechcraft. Call your Beechcraft distributor, or write to Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS



What's MISSING in this picture?

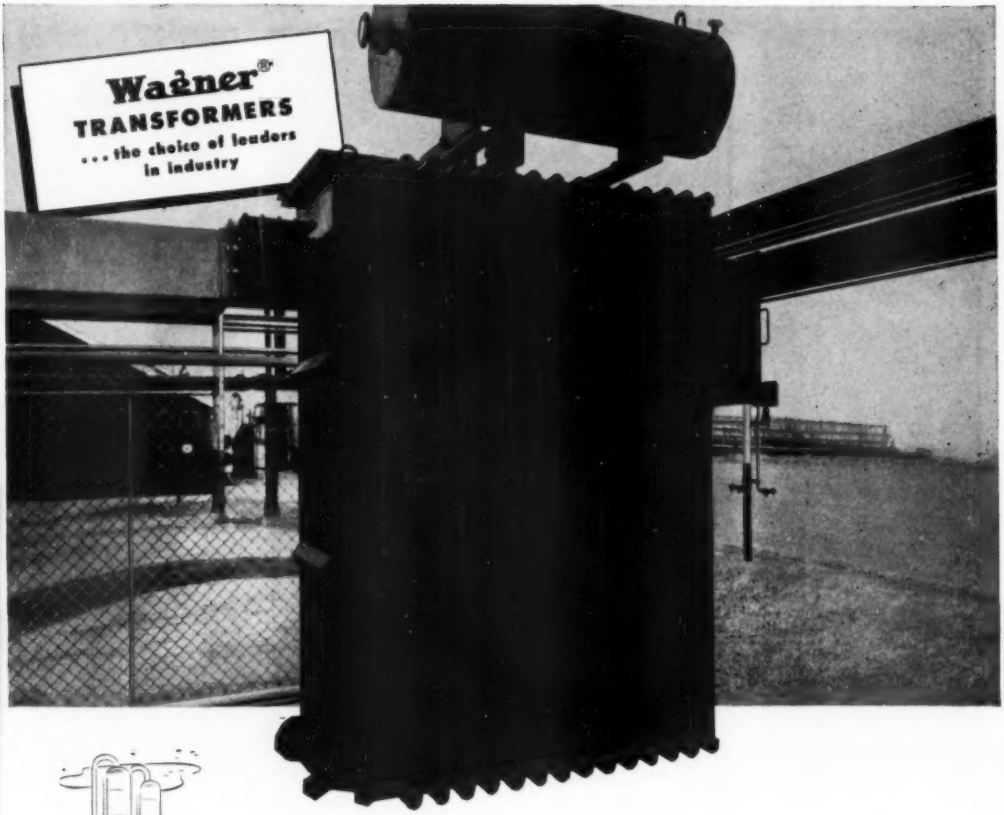
ANSWER: Halliburton cementing prices! While the cost of practically everything has soared, your dollar actually buys more in cementing service today than in 1924. Look for the answer in the Howco policy of passing on to customers the economies of efficient, large-scale operations.

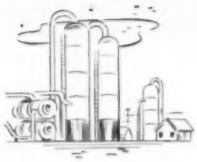
Erle P. Halliburton

Chairman of the Company

HALLIBURTON OIL WELL CEMENTING CO.

Duncan, Oklahoma





here's dependability at work!

This 2500 kva, 3 phase, 60 cycle Wagner Unit Substation Transformer is located in the high pressure division substation of the modern Ponca City Refinery of Continental Oil Company. It is throat-connected by means of weatherproof bus duct to switchgear located in an adjoining building and feeds all of the electrical load associated with the thermal cracking units and delayed coking units of this refinery. A power interruption of only a few minutes would completely disrupt this important processing and cause a shutdown of the entire refinery.

Wagner transformers are often found, furnishing *dependable* power, in spots where failure would incur great cost because they have a reputation for unfailing dependability—backed by sixty years of transformer building experience.

Bulletin TU-181 tells the complete story of Wagner Power and Substation Transformers. Write for your copy.

Wagner maintains 31 branch offices, located in principal cities, for quick, convenient engineering service and consultation. Call your nearest branch for competent advice on your next transformer installation.

Wagner Electric Corporation
1891 1951

TU-9

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6389 Plymouth Ave., St. Louis 14, Mo., U.S.A.

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AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

BRANCHES IN 31 PRINCIPAL CITIES

Since 1929, A. O. Smith has been helping the petroleum, Petro-chemical, chemical and paper industries solve many of their difficult corrosion problems.

The Ultimate JUDGE is TIME

Smithlined vessels have been in continuous corrosive service for over 20 years without failure of the lining attachment or the vessel itself.

This history of service is significant. It confirms the findings of our own research laboratories and supports the designs of our engineers, that closely controlled resistance-welding of stainless or other corrosion resistant liners to carbon steel vessel walls is the best means of providing long-term service and satisfactory performance under specific corrosion, pressure and temperature conditions.

If you have a corrosion problem, let A. O. Smith work with you in solving it. Our engineers and laboratories have an unequalled background of experience and data gained from hundreds of successful applications of Smithlining. Contact our nearest district office.

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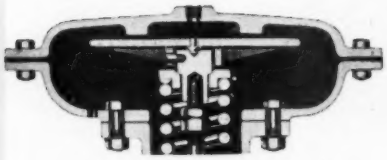
* COMPARE

THIS FEATURE

OF THE HONEYWELL SERIES "700" VALVE



Pre-Molded Neoprene Diaphragm, with rolling action. Eliminates wrinkling or buckling . . . responds to slightest change in signal air pressure . . . withstands excessive pressures . . . available with cotton or nylon reinforcement . . . permits use of gas as actuating medium.

Duplex Upper Stem Guide

Packless Bellows Seal

Safety Stem Lubricator

One-Piece Bonnet

Wide Variety of Discs

Reversibility in the Field

* Compare the diaphragm assembly of this valve with that of any other wide band proportional type. Look at it closely . . . study it feature by feature.

Then check the other features of the valve . . . the Duplex Stem Guide, the One-Piece Bonnet, the Packless Bellows Seal, the Safety Stem Lubricator, the wide variety of discs, the easy reversibility in the field from direct to reverse acting, or vice versa.

Your comparison will prove that the Honeywell Series 700 has *all* the features you look for in a fine valve.

It's available in a wide range of styles and sizes. For detailed information, write for a copy of Bulletin 750 or call in your local Honeywell engineer . . . he is as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 1906 Windrim Ave., Philadelphia 44, Pa. Offices in more than 80 principal cities of the United States, Canada and throughout the world.

MINNEAPOLIS **Honeywell**

Valve Products

IT ALWAYS PAYS TO SPECIFY

LADISH

Controlled Quality

PIPE FITTINGS

TO MARK PROGRESS

...where flow efficiency is a vital factor

You can depend on Ladish Controlled Quality Fittings to maintain maximum flow characteristics of any piping system . . . and do it consistently year after year. For advanced Ladish engineering assures the true circularity, full effective radii and smooth inner surfaces necessary to keep turbulence and friction loss at a minimum . . . features which are doubly safeguarded by the high, inflexible standards of Ladish Controlled Quality.

THE COMPLETE *Controlled Quality* FITTINGS LINE
PRODUCED UNDER ONE ROOF...ONE RESPONSIBILITY

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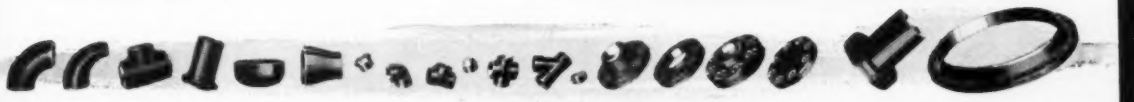

3 better ways to fight fires...

ALL WITH ONE NOZZLE

1 Fog FOAM
2 Solid FOAM stream
3 High Velocity WaterFOG

Rockwood *Double Strength* FOAM Liquid used thru Rockwood FFF FogFOAM Nozzles enables fire fighters to cover burning surfaces with a blanket of FOAM faster and more efficiently. The 3 methods — 1. FogFOAM, 2. Solid FOAM Stream and 3. High Velocity WaterFOG combined in the one FFF FogFOAM Nozzle will give you a *better weapon* for extinguishing and controlling fires in gasoline and other flammable liquids and materials.

Rockwood FOAM Liquid and FogFOAM Nozzles are now being used to fight large running gasoline fires and spill fires in oil refineries, fires in oil storage tanks — or for crash-rescue fire fighting at airports and also for municipal and industrial fire fighting requirements. All these hazards require special proportioning systems for discharging the FOAM Liquid. Custom engineered proportioning systems to meet such unusual requirements is a Rockwood specialty. For complete data and prices write today.

Remember, the most efficient way to apply Rockwood FOAM Liquid and Wetting agent to most fires is thru Rockwood fire fighting devices.

New Lightweight type FFF FogFOAM Nozzle with FogFOAM screen attached. Available in three sizes for service on 1½" and 2½" or 3½" hose.

(1.) Thru the FogFOAM screen a wide pattern of FogFOAM can be applied directly to the burning gasoline without harmful agitation to the surface. This means faster and more efficient extinguishment of fire. FogFOAM screen can easily be attached or removed.

(2.) Thru FOAM shaper a solid FOAM stream can be projected to reach fires at considerable distances. FOAM Shaper can also be easily attached or removed.

(3.) If FOAM Liquid supply is exhausted, the Rockwood FFF FogFOAM Nozzle will discharge a wide pattern of *High Velocity* WaterFOG.

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They're *continuously* right! BWH Rotocured V-Belts have no over-cured segments (weak spots) that fail. Vulcanization is continuous—*every inch* of the belt gets the same degree of curing — not too much — not too little.

These advantages are giving Happy customers longer life per belt and rock bottom maintenance costs. Ask your nearest Happy Company office about HAPPY BULL DOG V-BELTS or write direct to Boston Woven Hose & Rubber Company.

ROTOCURED V-BELTS PAY OFF FOR DRILLING CONTRACTORS 4 WAYS:

1. **In increased belt flex life — as much as 40%**
2. **In elimination of mechanical distortion at the press ends**
3. **In constant, uniform stretch**
4. **In uniform, abrasion-resistant covers**

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BOSTON WOVEN HOSE & RUBBER COMPANY

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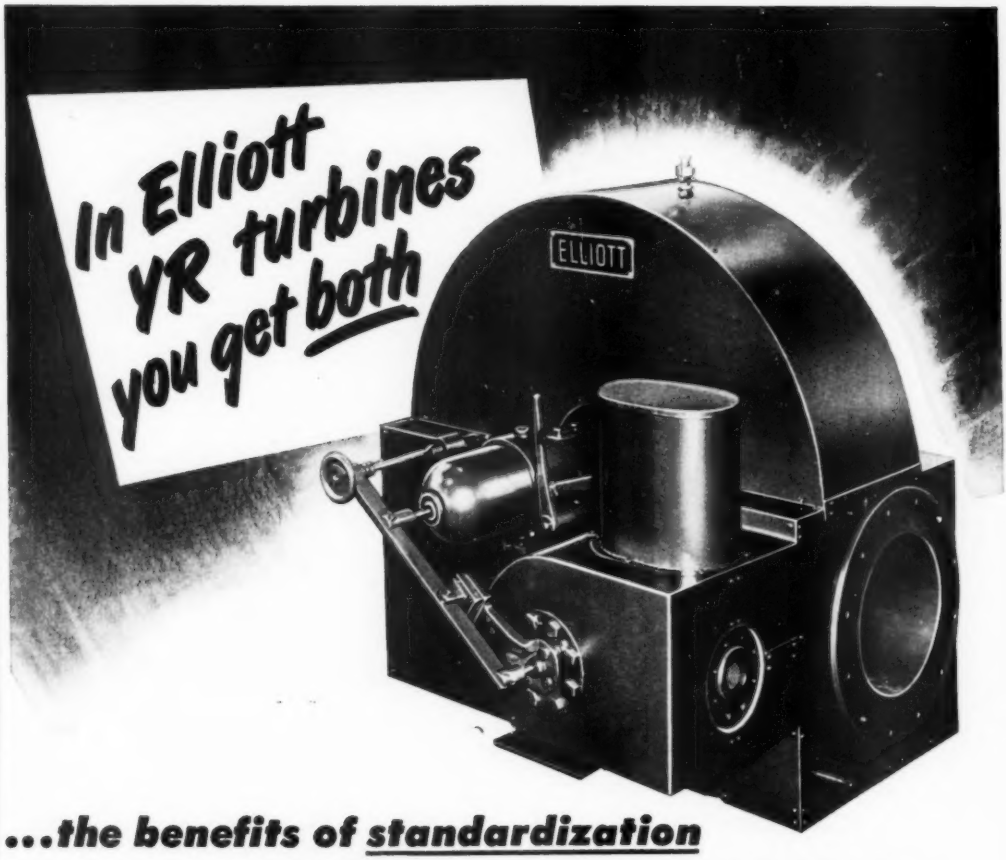
BWH Industrial Hose • Sure-Grip Sheaves • Happy Coolers
P & H Engine Starters • Rubber Belting • Safety Switches
Leather Belting • Happy Pumping Units • Bull Dog V-Belts
Power Transmission Equipment



...the benefits of standardization plus those of specialized design!

HOW? Because of a number of permissible modifications that enable the standard YR unit to meet practically any specialized application. Here are some of the adaptations:

Many elective governors, supplemented by the independent overspeed governor ... A variety of speed changers ... Gland sealing for operation with gas ... Gland seal piping for condensing operation ... Elective location of exhaust ... Five frame sizes, eight turbine types ... Capacities from 1 to 2000 hp, speeds from 800 to 6000 rpm ... Back pressures to 250 psig ... Supplied with built-in gear unit if desired. All this in totally enclosed, spark-proof construction. For full details write for Bulletin H-16.

HALF CENTURY OF 1901 EC 1951 POWER PROGRESS

H-733

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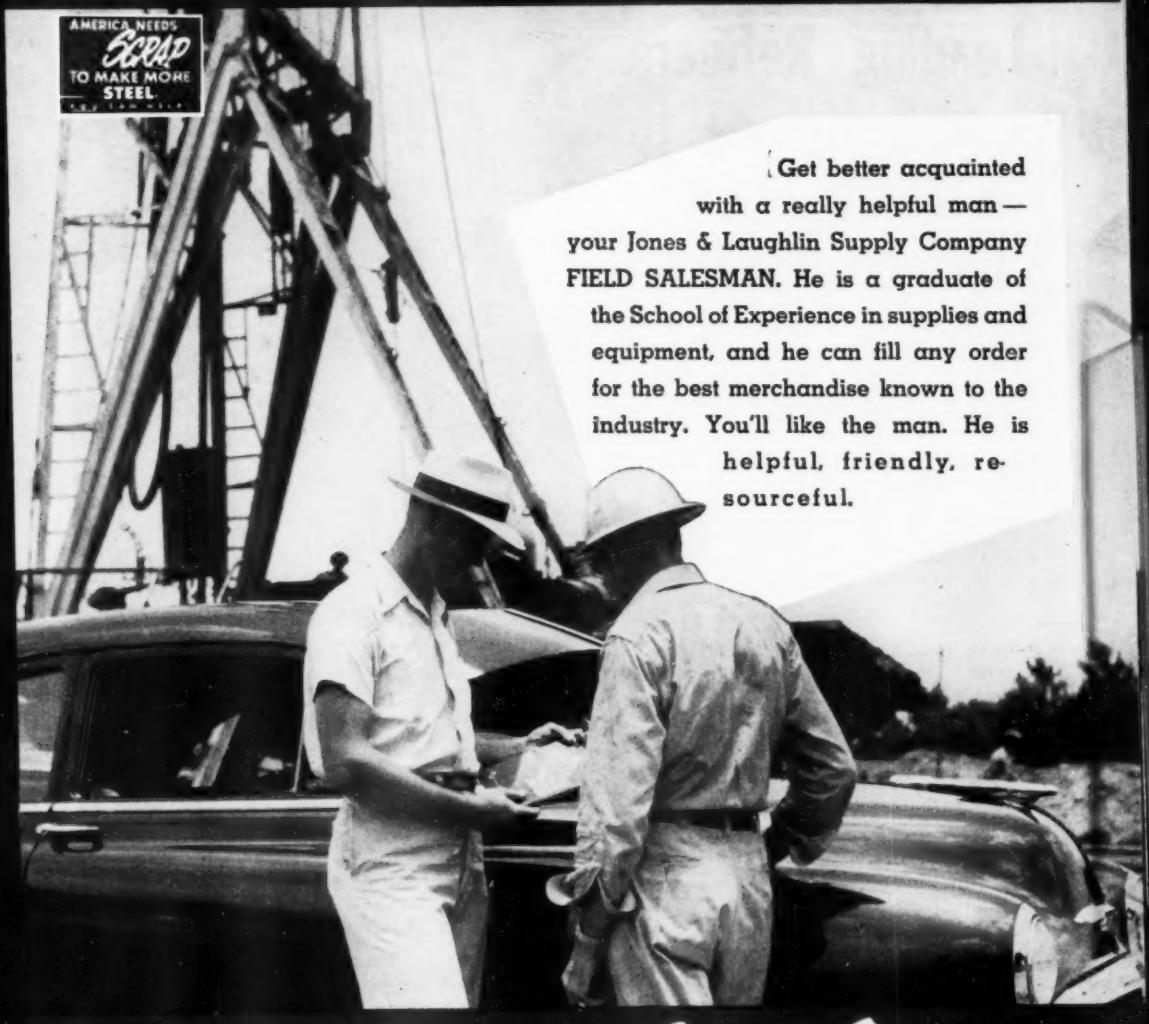
Plants at: JEANNETTE, PA. • RIDGWAY, PA.
AMPERE, N. J. • SPRINGFIELD, O. • NEWARK, N. J.
DISTRICT OFFICES IN PRINCIPAL CITIES

A GOOD MAN TO KNOW



Get better acquainted with a really helpful man — your Jones & Laughlin Supply Company FIELD SALESMAN. He is a graduate of the School of Experience in supplies and equipment, and he can fill any order for the best merchandise known to the industry. You'll like the man. He is helpful, friendly, resourceful.

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6 Reasons Why

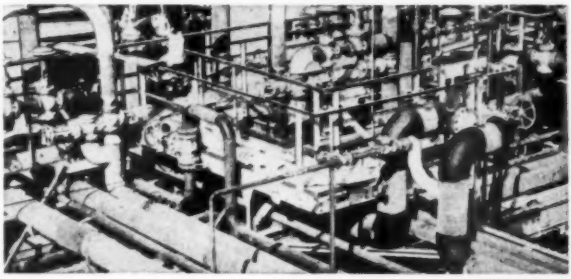
Leading Refiners Are Switching to KAYLO HEAT INSULATION

Through demonstrated superiority, Kaylo Heat Insulation is rapidly becoming recognized as the first basic advancement in the high temperature field in many years. Compare these advantages:

- Kaylo Heat Insulation is a calcium silicate (not glass)—an inorganic material which retains its stability in long service under severe conditions;
- Kaylo Heat Insulation has a wide effective temperature range—up to 1200°F.—eliminating need for combination covering in nearly all operating conditions;
- Kaylo Heat Insulation is insoluble in water. Work is not delayed by wet materials;
- High strength of Kaylo Heat Insulation practically eliminates spoilage both in transit and in application. Workmen can walk on insulated equipment without breaking insulation;
- Light weight along with high strength of Kaylo Heat Insulation makes application easier and faster;
- Simplified Dimensional Standards of Kaylo Pipe Insulation permit use of double layers for the higher temperatures without the use of special materials.

It will pay you to investigate the advantages offered by Kaylo Heat Insulation.

Applications of Kaylo Heat Insulating Block and Kaylo Pipe Insulation, The Texas Company Refinery, Lawrenceville, Illinois. M. W. Kellogg Company, New York, Designer and Builder. New construction includes units for fluid catalytic cracking, fractionation, gas recovery and catalytic polymerization.



SEE OUR CATALOG IN THE REFINERY CATALOG

For complete details on Kaylo Heat Insulation, write Dept. N-164, Owens-Illinois Glass Company, Kaylo Division, Toledo 1, Ohio.

KAYLO® ... *first in calcium silicate*

...*pioneered by* OWENS ILLINOIS Glass Company

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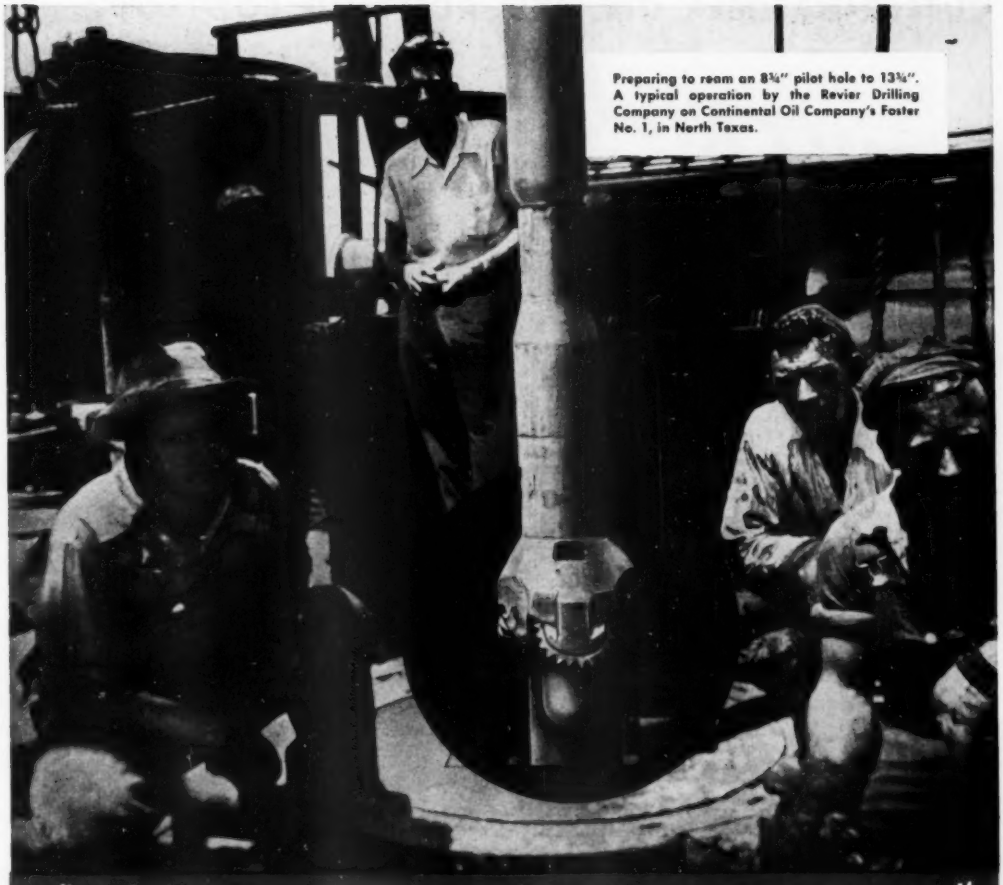

Preparing to ream an 8¾" pilot hole to 13¾". A typical operation by the Revier Drilling Company on Continental Oil Company's Foster No. 1, in North Texas.

"I'll use CP reaming bits every time"

Based on his long oil-field experience, J. B. Revier, drilling contractor, of Wichita Falls, Texas, states "for straight surface holes in fast time, I'll use CP reaming bits every time."

This is typical of the testimony of veteran drillers, who like the straight hole obtainable by reaming a pilot hole with a CP reaming bit.

CP Reaming Bits have three large, hardfaced cutter units which assure a true round hole, rapid cutting action and long life. Box down connection available to use rock bit instead of pilot blade, if desired. Reaming Bit sizes range from 10⅝" to 24".

Prompt service is assured in the Mid-Continent, Rocky Mountain, Canadian and Mexican fields.

CHICAGO PNEUMATIC TOOL COMPANY

MANUFACTURED AT FRANKLIN, PA.

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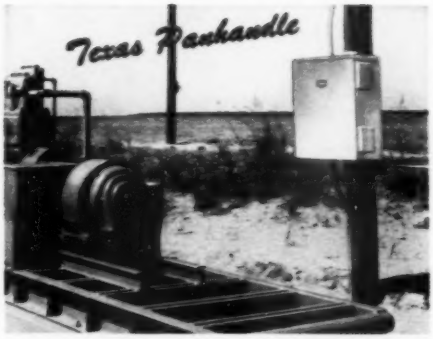
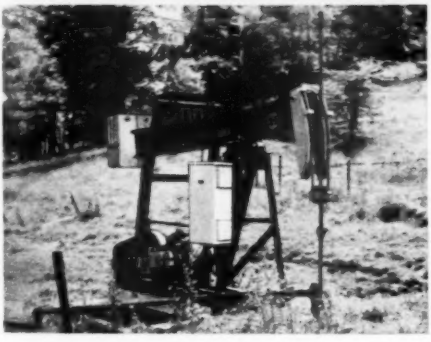
In Canada: 10103 81st Avenue, So. Edmonton, Alberta, Canada • In Mexico: Mexico, D. F., Rosas Morena No. 41; Tampico, Tamps., Apartado No. 174. Special Oil Tool Export Agent: E. F. Gahan, Inc., 500 Fifth Ave., New York 17, N. Y. (West Indies, Central and South America, exclusive of Mexico)

CUTLER-HAMMER OIL WELL PUMPING CONTROL

BUILT RIGHT PROVED RIGHT

—EVERYWHERE





Cutler-Hammer went to the oil country to design their oil well pumping control. How right they built it is proved by its outstanding performance in the Panhandle, on the Gulf, in both Midwest and East. Here's why operators everywhere prefer it.

Cool operation. Good ventilation, sound construction, properly designed overload heater coils, aluminum painted enclosures keep this controller *cool*. You never see a C-H Controller with its door propped open to keep it working.

Dependable performance in dust-laden air. Triple protected ventilation openings, Cutler-Hammer's exclusive vertical dust-safe contacts, neoprene-gasketed dustproof enclosed timer and timer clock motor with excess torque assure dependable performance.

Automatic staggered restarting. Cutler-Hammer Controller automatically restarts motors in proper sequence after power failures. Controller also available with or without undervoltage relay.

Other features. Lightning arresters are the unit type. If one blows you see it at a glance. And you don't have to virtually rebuild the starter. Changes in pumping sequence are made in definite 15-minute increments by pulling small accessible tabs. Clock is reset after stoppages by turning a handy palm-size dial forward or backward. Wiring diagram, spare parts list and overload heater coil ratings are printed on a plastic-coated, dirt, grease, heat and moisture repellent sheet enclosed in each starter case.

There's dependability, ruggedness and performance plus in these Cutler-Hammer Oil Well Pump Controls. CUTLER-HAMMER, Inc., 1453 St. Paul Ave., Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.

Other Cutler-Hammer Products for the Industry

Bulletin 9586 Across the Line Starter
For standard or high torque polyphase squirrel cage motors. Famous features, *vertical* dust-safe contacts, eutectic alloy overload relay. Rugged construction, ample reserve. Dust-tight or watertight enclosing case.

Bulletin 9589 Combination Starter
Across the line starter for squirrel cage motors, with side operated knife blade type disconnect switch combined in same special service enclosure. Completely wired. Saves time of installing two separate items.

Find the one nearest you . . . it will pay you to know him

. . . HE'S YOUR

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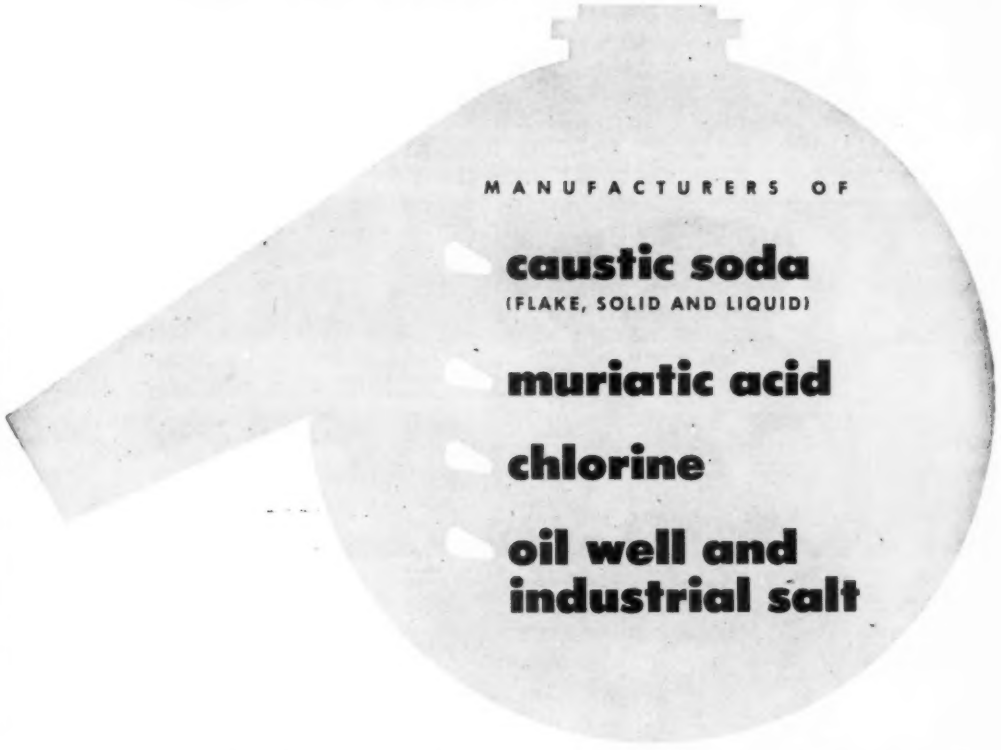
FRONTIER CHEMICAL COMPANY

Geared to Serve the Oil Industry



100% on-schedule deliveries from production points strategically located for prompt and efficient service throughout the Mid-Continent, Rocky Mountain and Southwestern areas.

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• DELIVERIES WHEN AND WHERE YOU NEED THEM VIA MOTOR TRANSPORT OR TANK CAR

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They Say—

Shale-Oil Opinion

"When technological developments make it economically sound to produce and refine oil from shale on a commercial basis, the amounts of capital necessary will be readily available from private sources. In the meantime, shale should not be used as an excuse to put the Government in the oil business."

Reese H. Taylor, Union Oil Co., as quoted in the Los Angeles Examiner.

Wildcatting Costs Too Much

"Wildcatting for oil costs too much, too often results in dry holes, and pays off too little even if oil is struck.

"The oil business is so highly speculative that more people probably have lost money in it than have made it."

Dallas Flandt, Jr., Indiana Geological Survey.

No Bonanza Here

"Contrary to general opinion, the oil industry is not the biggest money-maker among our many industries. It makes less than the average on the money invested in general business. Surprise was expressed when I first testified to this fact before a committee of the Congress. But I had the data to prove this fact.

"Four hundred other industries make more profits than does the oil industry.

"The record shows that the oil industry makes 4.27 cents on the dollar after taxes.

"The average for four hundred other industries is 4.48 cents on the dollar after taxes.

"On every oil-industry-dollar revenue there is paid 5.71 cents in federal and state income taxes. Other industries pay 5.48 cents in income taxes.

"So you can see that the oil industry is paying its way in taxes. Yes, even a greater percentage than other industries.

"Oil, in fact, pays more taxes and takes less profit than all the other industries of this country."

Ernest O. Thompson, Texas Railroad Commission, speaking in Amarillo.

Not So Hypothetical

"Can you imagine the Secretary of the Interior explaining to a Senate committee why they drilled in the 80 per cent of places that proved dry? Or, what is more likely, trying to explain why all the Democratic county chairmen had their ranches drilled on and the Republicans didn't?

"Could a group of 'experts' sitting in Washington have planned and directed a better system of distribution than has grown up through the competition of thousands of private concerns?

"We may be sure that those who believe in the laying on of hands by big government will take every possible advantage of any emergency, whether real or trumped up. We must be vigilant in guarding our inherited liberties. We must never yield one without keeping a string on it so we can get it back when the world is more peaceful."

Dr. Robert E. Wilson, board chairman, Standard Oil Co. (Ind.), addressing New Orleans Chamber of Commerce.

View on Synthetics

"I think you will agree that any industry which has invested something more than $14 billion in capital. improvements in six years thereby shows a very high degree of determination to stay in business.

"It follows also I think that if the day should come when it is necessary to use some other raw material than petroleum in order to obtain the products the oil industry now sells, the companies which comprise this highly competitive industry will be the first to turn to the substitutes without any urging or subsidy from the government. Pure selfish interest

announcing a new
Harbison-Fischer product—

HAYNES STELLITE
Super Alloy® Balls and Seats

FOR HIGHLY CORROSIVE and ABRASIVE FLUIDS

Super Alloy Balls and Seats are currently available in the more frequently used sizes of rib and flat type seats, and in both regular and California styles. Other sizes are being added to the line as rapidly as possible to make a full complement of stocks for all A.P.I. standard pumps.

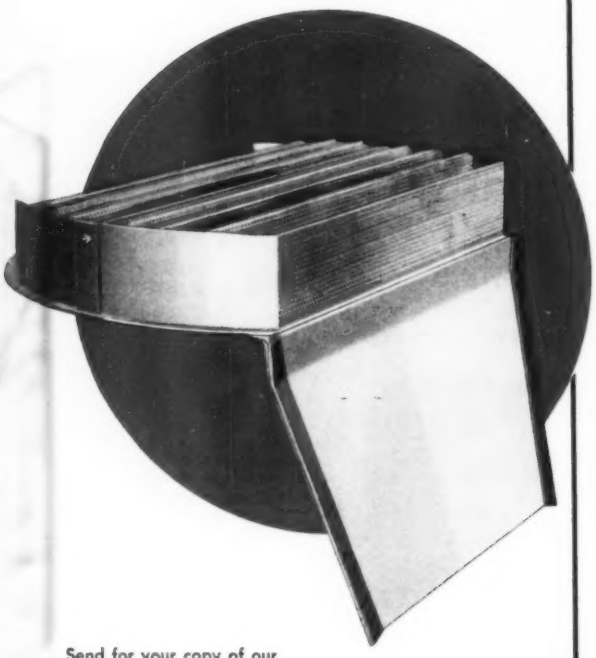
If you have pumping wells with extremely abrasive or highly corrosive fluids, we urge you to investigate these new Super Alloy Balls and Seats. They are unexcelled in wear resistance qualities and they are guaranteed to be corrosion-proof to any known petroleum gas and/or fluid. They have been developed scientifically — especially for service in tough wells, regardless of conditions. The alloy has a Rockwell C hardness of 64, a compression strength of 369,000 p.s.i., and an ultimate tensile strength of 77,000 p.s.i. The balls are finish-ground to within ±.001" and their sphericity is maintained within .0001" t.i.r. Each seat is individually ground and mated to the ball, and all seats are reversible for double life. Ask your local supply store about this new product . . . it will make more production possible . . . and more profitable production.

HARBISON-FISCHER MFG. CO. H·F FT. WORTH

These Progressive Operators

are obtaining higher capacities and greater efficiencies, plus lowered costs . . . with

KOCH KASKADE fractionating trays



Send for your copy of our new bulletin No. 629 which gives complete information on the new "Benturi" type Kaskade tray.

*American Liberty Oil Company
Arrow Petroleum Company
Ashland Oil & Refining Company
Bareco Oil Company
Barnsdall Oil Company
British-American Oil Company
Brockton Gas & Light Company
*Champlin Refining Company
Charleston Petroleum Company
*Cities Service Company
*Continental Oil Company
Daugherty Refinery
*Derby Oil Company
Dow Chemical Company
*El Dorado Refining Company
*Ford, Bacon & Davis, Inc.
Gas Machinery Company
Globe Oil & Refining Company
*B. F. Goodrich Chemical Company
Hope Natural Gas Company
International Paper Company
*Jefferson Chemical Company, Inc.
*Kanotex Refining Company
*Koppers Company
*Lakeside Refining Company
S. F. Laurason & Company, Ltd.
*Leonard Refineries, Inc.
Magnolia Petroleum Company
*Martinpool Gasoline Company
McCarthy Chemical Company
*M. F. A. Oil Company
Moose Jaw Refining Company, Ltd.
Mohawk Refining Company
*National Cooperative Refinery Association
Natural Gas Odorizing Company, Inc.
Padre Petroleum Company
*Paluxy Asphalt Company
*Peppers Refining Company
*Chas. Pfizer & Company
*Phillips Petroleum Company
Plains Natural Gas Company
Polymer Corporation
Rado Refining Company
Refinery Engineering Company
*Rock Island Oil & Refining Company
*Rock Island Refining Corporation
*Roosevelt Oil Corporation
Shamrock Oil & Gas Corporation
*Skelly Oil Company
*Socony-Vacuum Oil Company
South Carolina Electric & Gas Company
*Southwestern Oil & Refining Company
*Stanolind Oil & Gas Company
*Spencer Chemical Company
Sunray Oil Corporation
*The Texas Company
*Texas Natural Gasoline Corporation
Union Carbide and Carbon Corporation
*Warren Petroleum Company
*Wood River Oil & Refining Company

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AGIP, Italy
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*Anglo Iranian Oil Company
The Bahrein Petroleum Company, Ltd.
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* Multiple Installations

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Myers-Bogwell Co.
Wright Bldg.

British Associates
Messrs A. F. Craig & Co., Ltd.
Paisley, Scotland

coupled with the universal instinct of survival are enough to guarantee that.

"It is indeed a comfort to know that we can make oil products from other raw materials than crude oil when and if it ever becomes necessary but to try to do so today, clearly would only result in higher cost products than those which can be obtained from crude oil."

Sidney A. Swensrud, president, Gulf Oil Corp., speaking in Cincinnati.

Ex-Cotton Town

"Suppose petroleum had never been discovered in Texas . . . what would Houston be now? A nice little cotton port, perhaps as big as Des Moines, Iowa.

"The one-word reason why the world is talking about Texas, the 'land of the big rich,' is—Oil. It made Houston the petropolis of the South, the greatest oil center in the country. Every inhabitant of Harris County is affected economically by oil and natural gas; a large percentage of them directly."

Editorial in the Houston Post.

Difference in Control

"At this hour, when our military authorities are calling for more and more oil exploration and development, the tidelands are completely barren of drilling rigs. Under state ownership they would be a beehive of activity."

Walter S. Hallanan, president, Plymouth Oil Co., addressing Mississippi-Alabama Division, Mid-Continent Oil and Gas Association, Biloxi.

Most Important Product

"Of all the products known to man oil is probably the most important to the maintenance and the development of our present industrialized age."

Marlin M. Volz, dean of the school of law, University of Kansas City, addressing the Junior Chamber of Commerce, Independence, Mo.

CALENDAR

November

American Society of Mechanical Engineers, annual meeting, Chalfonte-Haddon Hall, Atlantic City, November 25-30.

Twenty-third Exposition of Chemical Industries, Grand Central Palace, New York City, November 26-December 1.

December

American Institute of Chemical Engineers annual meeting, Chalfonte-Haddon Hall, Atlantic City, December 2-5.

Chemical Specialties Manufacturers Association, thirty-eighth annual meeting, Mayflower Hotel, Washington, D. C., December 3-4.

American Gas Association, Gas Production Research Committee, Tulsa, December 6-7.

Interstate Oil Compact Commission, an-

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FREE ENTERPRISE — THE CORNERSTONE OF AMERICAN PROSPERITY

nual meeting, Hotel Marion, Little Rock, Ark., December 11-12.

American Association for the Advancement of Science, annual meeting, Philadelphia, December 27-28.

1952 Meetings

January

Society of Automotive Engineers, annual meeting, Hotel Book-Cadillac, Detroit, January 14-18.

American Institute of Electrical Engineers, winter general meeting, Hotel Statler, New York City, January 21-25.

February

American Society for Testing Materials, Committee D-2 on petroleum products and lubricants, Shoreham Hotel, Washington, D. C., February 3-8.

Missouri Petroleum Association, annual convention and trade exhibit, Jefferson Hotel, St. Louis, February 4-6.

American Petroleum Institute, Division of Marketing, lubrication-committee meeting, Hotel Book-Cadillac, Detroit, February 18-19.

Wisconsin Petroleum Association, twenty-sixth annual convention and equipment show, Milwaukee Auditorium, Milwaukee, February 26-27.

American Association of Petroleum Geologists, Rocky Mountain Section, second annual convention, Salt Lake City, February 28-29.

March

American Society for Testing Materials, spring meeting, Hotel Statler, Cleveland, March 3-7.

American Petroleum Institute, Division of Production, southwestern district, Washington-Youree Hotel, Shreveport, March 5-7.

National Association of Corrosion Engineers, eighth annual conference and exhibition, Galvez Hotel, Galveston, Tex., March 10-14.

American Institute of Chemical Engineers, regional meeting, Atlanta, March 16-19.

American Petroleum Institute, Division of Production, Mid-Continent district meeting, Broadview Hotel, Wichita, Kans., March 19-21.

American Association of Petroleum Geologists, annual meeting, Los Angeles, March 23-27.

American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, and Society of Exploration Geophysicists, joint annual meeting, Biltmore Hotel, Los Angeles, March 24-27.

Western Petroleum Refiners Association, annual meeting, Plaza Hotel, San Antonio, March 31-April 2.

April

American Petroleum Institute, Division of Production, eastern district, Hotel William Penn, Pittsburgh, April 2-4.

Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, April 8-10.

American Institute of Electrical Engineers, District 7 meeting, Hotel Jefferson, St. Louis, April 15-17.

American Petroleum Institute, Division of Transportation, pipe-line conference, Blackstone Hotel, Fort Worth, April 21-23.

American Petroleum Institute, Division of Production, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., April 24-25.

Southern Gas Association, annual convention, Galveston, Tex., April 28-30.

American Institute of Electrical Engineers, District 1 meeting, Binghampton, N. Y., April 30-May 2.

Natural Gasoline Association of America, annual meeting, Rice Hotel, Houston, April 30-May 3.

May

American Geophysical Union, thirty-third annual meeting, National Academy of Sciences, National Research Council, Washington, D. C., May 5-7.

American Institute of Chemical Engineers, regional meeting, French Lick, Ind., May 11-14.

American Gas Association, Natural Gas Department spring meeting, Biltmore Hotel, Los Angeles, May 12-13.

American Petroleum Institute, Division of Refining, seventeenth midyear meeting, San Francisco, May 12-15.

American Petroleum Institute, Division of Production, Pacific Coast district, Biltmore Hotel, Los Angeles, May 15-16.

American Petroleum Institute, Division of Marketing, midyear meeting, Copley Plaza Hotel, Boston, May 19-20.

Gas Appliance Manufacturers Association, annual meeting, Broadmoor Hotel, Colorado Springs, Colo., May 21-23.

American Gas Association, production and chemical conference, Hotel New Yorker, New York, May 26-28.

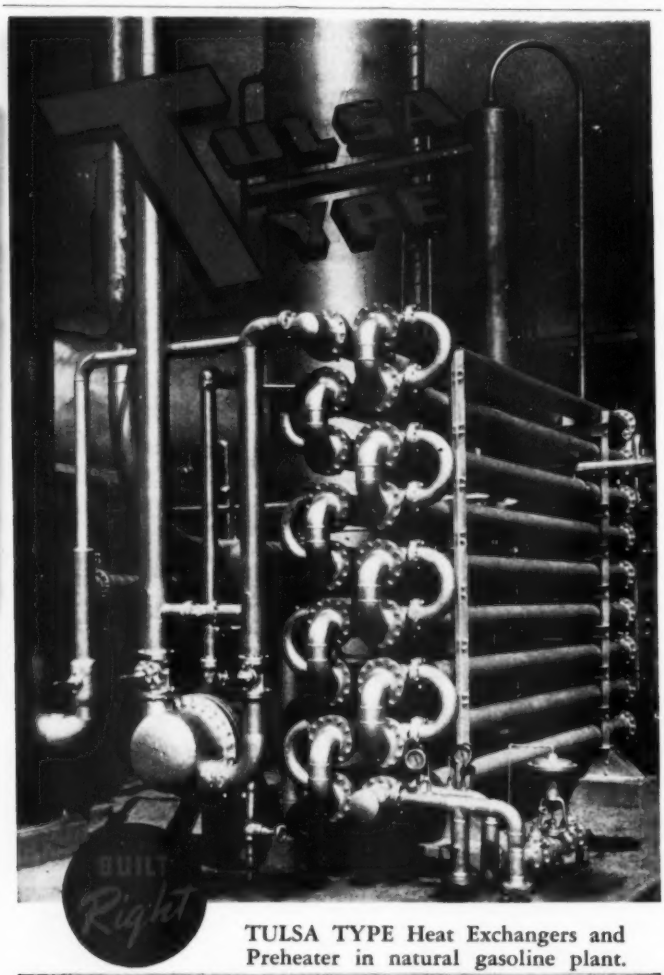
June

Pennsylvania Grade Crude Oil Association, annual meeting, Hotel William Penn, Pittsburgh, June 5-6.

Canadian Gas Association, Chateau Frontenac, Quebec, June 8-12.

American Petroleum Institute, midyear standardization meeting, Brown Palace Hotel, Denver, June 9-14.

American Institute of Electrical Engineers, summer general meeting, Hotel Statler, New York City, June 23-27.



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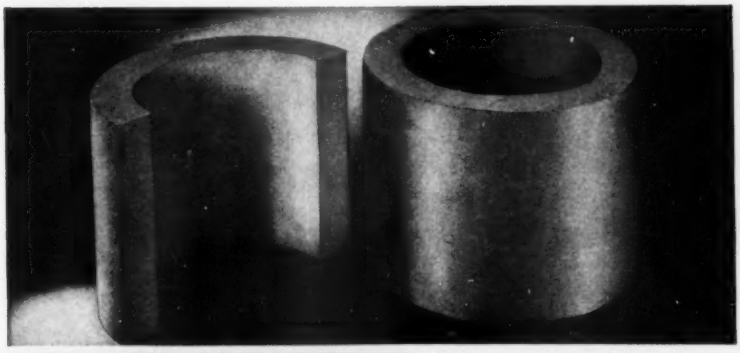
Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

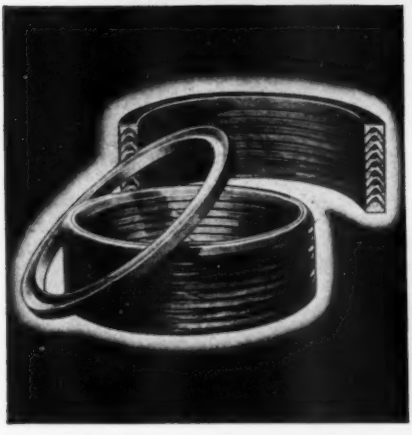
Houston Nomads, second Monday of each month, Ye Olde College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club.

New York Nomads: December 8, Christmas dinner dance, Hotel Pierre.

What's U. S. Rubber doing in rotary drilling pumps?





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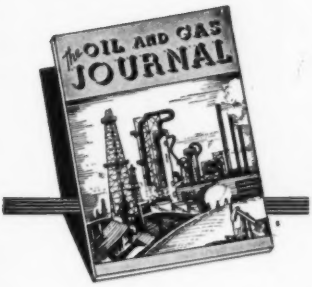

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JOURNALLY Speaking

Apropos the A.P.I.

EVERY time we attend an A.P.I. meeting we are impressed by three things: (1) the number of people we know; (2) the number of people we don't know; (3) the number of people.

The ancients had a saying to the effect that if you stood in the marketplace of Damascus long enough you would see all the people in the world. That's about the way it is at an A.P.I. meeting, with five or six thousand oil men milling around. It seems as though you would see everybody in the oil business if you just stand in the hotel lobby throughout the convention.

As a matter of fact, we suspect that that's exactly why a good many people go to the A.P.I. Of course a lot of them are working hard attending committee meetings and taking part in the program, but the oil business is so fraternal in nature that a major activity at the big meeting is the renewal of old acquaintanceships.

This gives some point to the apocryphal story of the two A.P.I. delegates, strangers to each other, who were forced to share a hotel room. One had to deliver a paper the next morning, so went to bed early in hopes of getting a good rest. He had barely got to sleep when his roommate turned on the light, fumbled in his suitcase, and explained apologetically that his corns hurt so that he couldn't sleep and he had to put some medicine on them. About an hour later the same thing happened again, with the explanation that he had a bad case of poison ivy on his hands and needed to put some ointment on them. Hardly had the serious man got back to sleep when the light went on again and the roommate hobbled to the bathroom with the explanation that he had a bad ulcer and needed to take some medicine. At that the would-be sleeper exploded: "Shucks, man, you can't drink, stand around, or shake hands. Why in the world did you come to the A.P.I. anyway?"

We wouldn't know anything about that drinking part (though we were told there was some done) but we can testify that there was a great deal of standing around and shaking hands. There's a lot of the extrovert and the gregarious in every oil man and even if you have to deliver a paper you miss half the value of the A.P.I. if you don't stand around and shake hands.

Spelling in Utah

THAT letter from "Uintah Liz," published in this department September 20, has stirred up quite a controversy over the spelling of Unita (Uintah) as applied to Indians, counties, forests, mountains, and basins in northern Utah.

Liz insisted the "h" should be appended in all cases, while we cited presumed authorities for leaving it off. Now Liz gets unqualified support from Roy M. Johnson, independent producer of Ardmore, Okla., and Vernal, Utah. He has searched the historical literature back to 1861 when President Lincoln set up the Unitah Indian reservation with an "h," and he traces the "h" uninterruptedly right down to the present time where it appears on some of his own leases on Indian lands.

This evidence we are not prepared to dispute. All we know is that there is a difference of opinion on the spelling of this place name and that our favorite oil publication has been following some pretty good precedents in leaving the "h" off of all of them except Unitah County, Utah. Up in Wyoming the preference seems unanimous to stick to just plain Unita which, according to Uintah Liz, is because "those cowpokes just don't know how to spell." If the inhabitants of Vernal and environs can get a representative number of authorities to restore the lost "h," the Big Yellow Book will follow suit and say no more about it.

As we recall, Vernal is the town that built a building by mailing the bricks in one at a time after finding that the postage rate was lower than the cost of hauling them from the nearest railroad. That incident caused the Post Office Department to change the parcel-post regulations, and it may have been that the Government knocked the "h" out of the whole end of the state at the same time.

—*Henry D. Ralph.*

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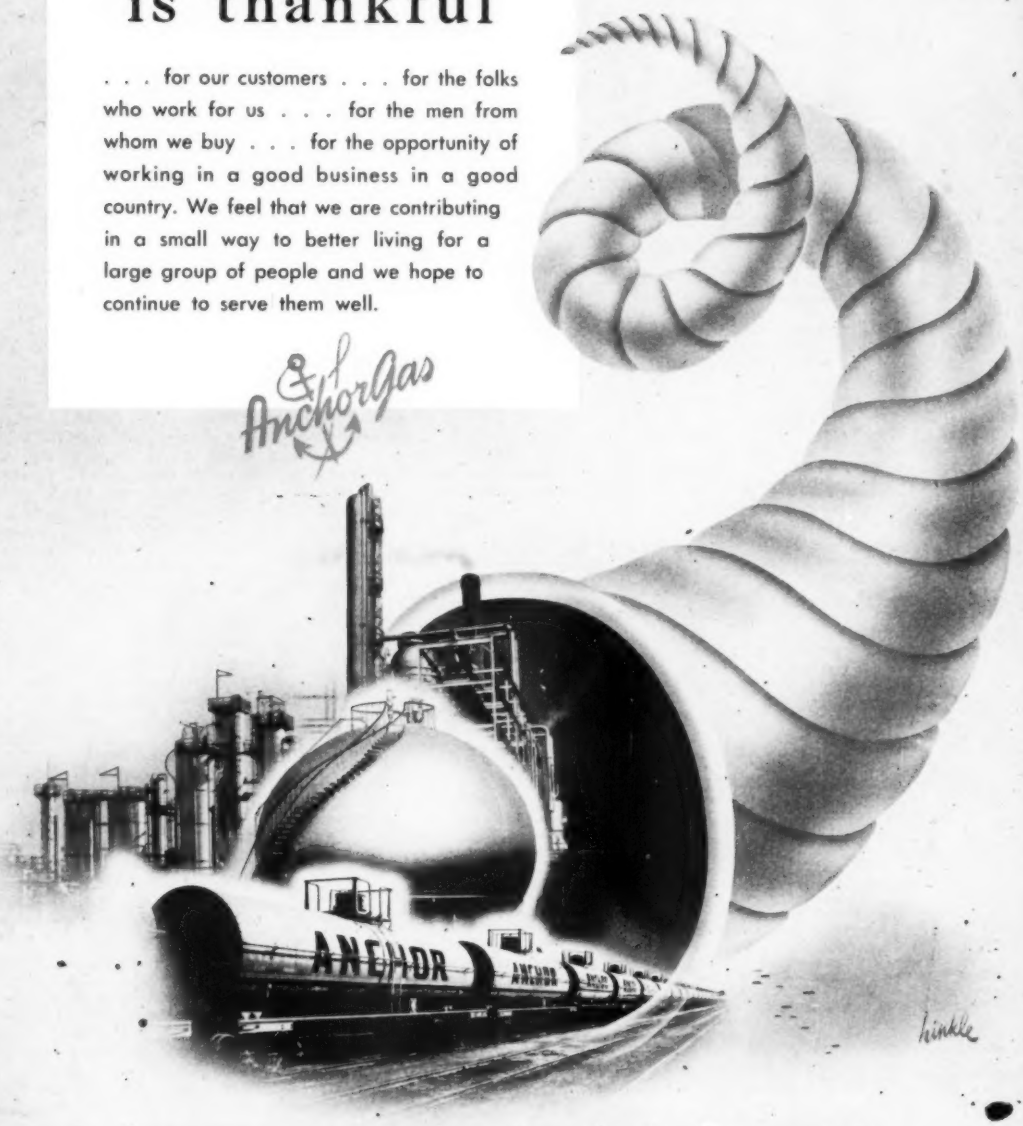

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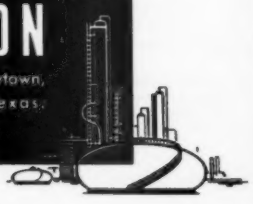


Crude Oil, Natural Gasoline and Liquefied Petroleum Products

Synthetic Fuels Now?

Why is the Interior Department so insistent upon immediate construction of plants to make synthetic liquid fuels out of coal or shale?

In his A.P.I. speech Secretary Chapman said that there is no disagreement that synthetic fuels will be needed sometime and the only arguments with the oil industry are over "how" and "when". Apparently he has answered both these questions to his own satisfaction by deciding that the time is now and that the method is for the federal Government to do it.

The oil industry has often given its answers to the how and when of synthetics: Synthetic fuels will be commercially practical when their cost comes down to the competitive range with petroleum fuels.

The Interior Department has figures purporting to show that these costs are competitive now, but the oil industry says true costs are three or four times as high. If the department's figures were realistic there would be no argument over government operation, for private industry would be building plants today. And that industry would be the oil industry, because oil men have no intention of surrendering the liquid-fuel market. Several oil companies have spent millions on research into making liquid fuels from shale and coal, and they are ready to produce synthetic fuels when they are needed and when they are economic.

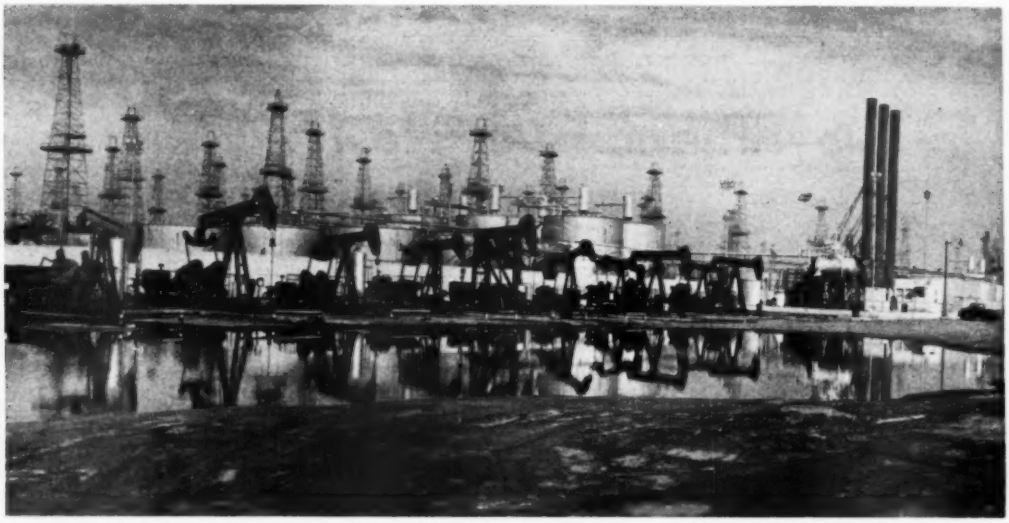
Synthetic fuels will be needed—and will be forthcoming—when petroleum becomes so scarce that its price is forced up to about the cost of synthetics, whatever that cost may be. But as the price goes up, more petroleum fuels will be brought onto the market.

Higher price will make it profitable to prospect in less accessible and less promising areas, to drill the deeper and less productive formations, and to keep producing from stripper wells now considered marginal. It will bring about more efficient producing methods and promote many secondary-recovery operations. It will shift refinery yields and processes to produce more automotive fuels and less burning oils, thus expanding the market for coal for stationary uses.

This process will delay the time when synthetic fuels are needed, but it will increase conservation and utilization of the nation's natural resources—which should be the chief concern of the Interior Department—and the gradual price rise will bring about the introduction of synthetics competitively and without disruption of the economy.

But Chapman can't wait. His stated reason for trying to force what industry says is uneconomic and unnecessary—possible defense needs for alternate fuels—is unrealistic and unconvincing. This leaves the suspicion that the department's real motivation is something else. Is it just bureaucratic zeal to see tangible fruition of laboratory research, or is there a more hidden, more sinister motive?

THIS WEEK



UNWANTED LAKE.—Proof that at least one portion of California's Wilmington field is now below high-tide level of the ocean is this pool, which was formed by seepage of ground water to the surface. With the area still sinking, the Long Beach Harbor Department has begun a multimillion-dollar program to build dikes in some areas and to fill in others to protect its huge interest in the Terminal Island oil field. An article on the current dike-and-fill program may be found on page 45.

PRODUCTION—Texas' crude-oil allowables cut 72,519 bbl. to 2,924,918 bbl. daily for December as a result of high stocks aboveground. . . . ¶Railroad Commission approves unitization plan for pressure maintenance, secondary recovery of a portion of Canyon reef formation in Diamond M field of Scurry County, Texas. . . . Lion Oil will be the operator. . . . ¶Second major water-flood program for Osage Nation inaugurated in ceremonies near Shidler, Okla. . . . Additional 5,000,000 bbl. of oil expected to be produced. . . .

WASHINGTON—Any attempt on part of Interior Department to take over development of Gulf tidelands oil to bring quick retaliatory action from Congress, administration warned. . . . ¶Procurement authorization for crude, products issued by ECA to Marshall Plan countries reached 1¼ billion dollars at close of fiscal year. . . . ¶Bruce K. Brown announces resignation from PAD, effective June 1, and will be succeeded by J. Ed Warren, Midland, Tex., independent. . . .

EXPLORATION—Job of exploration geologist in future to become more complex, costly, Gulf Coast Association of Geological Societies told. . . . ¶Use of newer tools, better training of men, redistribution of crews now can result in substantial savings, cut down on dry-hole waste, group hears. . . . ¶Geophysics is approaching maturity, Gemmer tells S.E.G. group at Dallas. . . .

STEEL—Only 1,855 oil and gas operators qualify on initial application for allotments of casing and tubing for first quarter of 1952, PAD reports. . . . They will receive 302,000 tons out of allotment of 466,000 tons given to agency by DPA. . . . Allocation for drill pipe not yet firm but is expected to be about 30,000 tons. . . .

INDUSTRY—City of Long Beach, Calif., starts huge dike-building, earth-filling project in battle against the sea, which is threatening to inundate production facilities as land continues to sink. . . . ¶Platte Pipe Line Co.'s crude carrier from Worland, Wyo., to Wood River, Ill., to pump oil within 2 or 3 weeks after final joint of pipe leaves mill in July or August 1952, president declares. . . . ¶Commercial airlines voice need for rugged, cheap fuel with highest possible B.t.u. content for operations in coming era of jet-powered aircraft. . . .

INTERNATIONAL—Opposition appears to be building up against granting of United States loan to Iran. . . . Britain reaction reported unfavorable. . . . ¶Kuwait Oil, sheik of Kuwait finally settle on terms of new 50-50 participation contract, London reports indicate. . . . ¶Record demand for Kuwait oil taxing field facilities, but expansion will boost Burgan output to 900,000 bbl. daily. . . . ¶Creole reports its Venezuelan production averaged 725,204 bbl. daily in September. . . .

ACTIVITY—Daily average crude production for week ended November 17 was 6,143,150 bbl., up 3,435 bbl. . . . ¶Total well completions for the week decreased 9 wells to 896. . . . Wildcat completions totaled 235 compared with 201 for previous week and 181 for same week last year. . . . ¶Rotary rigs operating in United States on November 12 numbered 2,876, a decrease of 42 rigs from the all-time high reported a week earlier.

TRENDS—Stocks of crude and four major products decreased 370,000 bbl. daily for week ended November 10. . . . Distillate stocks decreased for the first time this season, down 70,000 bbl. daily. . . . Gasoline stocks are now only 4,000,000 bbl. greater than last year. . . .

Exploration Critique

Weatherby says savings lie in use of newer tools, better training of men; redistribution of crews is recommended

Philip C. Ingalls

DALLAS.—Dry-hole waste can be cut down if geophysicists will make complete use of the tools available to them, Dr. B. B. Weatherby, Amerada Petroleum Corp., Tulsa, told geophysicists here this week.

DR. WEATHERBY

Addressing the fifth annual midwestern meeting of the Society of Exploration Geophysicists, Weatherby said that today's geophysical crews are not using all of the latest instruments or are not using these instruments to the fullest advantage because of the lack of trained men.

Geophysical contracting companies, which carry 60 per cent of the responsibility for seismic exploration, and the geophysical departments of oil companies, he said, must make better use of existing tools — they must obtain the latest instruments and work out methods of giving thorough training to more and more men —if this country is to maintain its productive capacity.

This productive capacity, Weatherby said, is 2¼ billion barrels of oil yearly. To illustrate the size of the job of keeping the nation supplied, Weatherby pointed out that all of the reserves proved by the highly publicized discoveries in Alberta, Canada, would last but 6 months at this country's present rate of production.

Further, he said, the sprawling Spraberry field of West Texas, if it actually contains the spectacular 2 billion barrels estimated by some, would be but 1 year's supply at present production rates.

New targets needed.—Distribution of seismic effort is poor, Weatherby declared. Too many crews are tied up in old producing areas which have been shot 20 or 30 times, in some cases. This gleaning work, because of better instrumentation, is finding oil fields, but these fields are getting smaller and smaller.

Weatherby, a director of Amerada, the company which started the furor in the Williston basin, would like to see a greater portion of the seismic effort directed to what he called the "wide open spaces" of the north-central and Rocky Mountain states where, he said, big oil fields may be expected.

Closer scrutiny urged.—Directing his remarks at the seismograph interpreters present, Weatherby said seismic records contain a great deal more information than is being obtained from them in many instances and said he would like to see interpreters "bleed the data dry."

Seismic data is essential if the success ratio of wildcats is to be improved, Weatherby said. Using the Rocky Mountain area for specific examples, Weatherby pointed out that structures mapped by surface and core drilling may have no relation to structure at the depth where oil might be expected.

Many dry holes, he said, have been drilled on surface structures that the seismograph has shown to have been nonexistent at depth. On the other hand, he said, some structures are offset at depth, and tests located on surface geology alone should not condemn a structure.

The seismograph also can locate structures which exist at depth without surface expression. Only through the use of the seismograph can such knowledge be acquired without the expense of drilling deep tests.

Future of Geology

Morgan tells geologists their job will get tougher, more expensive; he urges companies to look into untried areas

Philip C. Ingalls

NEW ORLEANS.—The job of the exploration geologist in the future will be more complex and more costly, Frank A. Morgan told the 800 geologists gathered here for the first annual meeting of the Gulf Coast Association of Geological Societies.

The search for oil will run into increasing problems and require greater risks, he said, and there must be "a united effort to encourage exploration on a broad scale and to compensate for" these increased risks.

Morgan, vice president in charge of exploration of Richfield Oil Corp. and president of the American Association of Petroleum Geologists, said the tempo of the future search for oil will be determined by the "accelerating consumption of oil," but he told the geologists that the oil will be found as it is needed.

"I believe the oil industry, with its exploration geologists, can do the job," he said. "However, the oil-finding business of the future will be progressively more difficult. Not only will it require new concepts in cost, in manpower, and materials, but the demands for results and the responsibilities for discovery are rapidly increasing."

Morgan said the United States is now consuming 16 bbl. of petroleum products per capita per year and the rest of the world is using 1 bbl. per year. The growth of these consumption figures will determine the effort the exploration branch of the industry must make to keep reserves in proper ratio to production, he said.

Wider search urged. — "The ingredients for oil-finding success," he said, "are knowledge, imagination, courage, and work, plus action. If we are to go on finding oil we must throw off the prejudices of the past and go 'fish' where others have not dared to fish before.

"Technological advances are inevitable in the science of oil finding. The pessimistic figures about decreasing discovery rates per well, per foot, per ton of paper sent to Washington that come from the economists and statisticians are based on yardsticks that are obsolete as rapidly as they are developed."

The undiscovered reserve of petroleum in the United States, Morgan said, is undoubtedly very great, even in proportion to the 70 billion barrels which we have proved so far. He paid tribute to the A.A.P.G., saying its 8,700 members scattered over the world constitute an "important part of the great petroleum industry."

Morgan said we must guard against relaxing our exploratory efforts in order to develop shale-oil plants or we'll lose the touch of oil finding, which obviously we cannot afford in the foreseeable future.

Restrictions attacked. — S. L. Digby, Louisiana conservation commissioner, told the geologists that a police power is needed to protect this country's natural resources, but he said that government restrictions on industries exploiting those resources must be held to an absolute minimum.

Government interference, he said, is hampering this country's industrial

STEERING COMMITTEE.—Shown here are geologists who were responsible largely for the New Orleans meeting of the Gulf Coast Association of Geological Societies. Seated, left to right, are: R. W. Eaton, East Texas Geological Society representative, meeting publicity chairman; Leslie Bowling, New Orleans Geological Society, steering committee chairman; R. D. Sprague, Mississippi Geological Society; and E. L. Earl, Houston Geological Society. Standing, left to right, are Charles De Blieux, New Orleans Geological Society, publicity committee; Aime Claudet, New Orleans Geological Society; T. H. Philpott, Shreveport Geolcgical Society, program chairman; W. H. Wallace, Jr., Corpus Christi Geological Society; and W. R. Farley, South Louisiana Geological Society.

development and threatening our free-enterprise system.

Free enterprise, Digby said, didn't just happen but developed and survives because of three cardinal practices:

1. Integrity and honest in business and industry. (2) Competitive effort and reward commensurate with effort and ability, and (3) dignity of the employes in the industry.

Digby said that the oil industry typifies all of these practices. But, he added, we must continue to fight for preservation of the free-enterprise system for the advancement and future progress of our great country.

Public - relations needed. — Digby pointed out that his commissions must rely on the help of the geologists and petroleum engineers of the oil industry and that he has received wonderful cooperation. The men in the oil industry have built confidence among those who know them but they have been negligent in their public relations campaigns between the operator and the landowner, between the industry and the public. This public-relations job is an important one and one that must be given more attention.

The production of crude oil in Louisiana has increased steadily from 166 million barrels in 1947 to an estimated 235 million barrels in 1951, yet the proved reserves are greater today than ever before, Digby said. Records during the past 6 months show an 18 per cent decrease in development drilling and a like increase in wildcat activity which has resulted in an increased number of dry holes completed by the more than 300 rigs operating in the state, he added.

Growing Up

Gemmer says geophysics is out of its childhood days

DALLAS.—Geophysics, the youngster of the oil industry, is approaching maturity, R. W. Gemmer told the 1,000 registrants at the fifth annual midwestern meeting of the Society of Exploration Geophysicists held here November 19-20.

In his welcoming address, Gemmer, chief geophysicist of Carter Oil Co., Tulsa, said: "Not only have we recovered from childish, exaggerated ideas of our importance but also from our failures that were the natural result of our early enthusiasm. Geophysics is no longer considered a replacement for any exploration method, but has fitted in as a working member of the oil-finding fraternity."

Gemmer is president of the Tulsa Geophysical Society, which acted as leader in preparing the Dallas meeting. Other participating societies were the Dallas Geophysical Society, the Ark - La - Tex Geophysical Society, Shreveport, the Fort Worth Geophysical Society, and the newest member of the midwestern group, the Permian Basin Geophysical Society, Midland.

Gemmer said that such meetings as the one held here offer exceptional privileges for attending geophysicists to become better prepared to play the game of finding oil. "They offer an opportunity to talk and listen to those who have been successful in various phases of the game we are playing," he said. For, he added, exploratory geophysics is a game with the opponent being Nature, which has made and hidden oil in the ground. It is a difficult game and one that stays interesting because it is still above the level of understanding.

(Abstracts of many of the technical papers presented at this meeting will be found on pages 84 and 86 of this issue).

Big Products Line

Shell prepares for Wood River-to-Detroit project

NEW YORK.—Shell Oil Co. is preparing for construction of a 565-mile products pipe line from Wood River via East Chicago to Detroit.

The big line will have an initial capacity of 85,000 bbl. daily and cost in the neighborhood of $15,850,000. Contracts are expected to be let this year for the first line-laying work.

New 14-in. pipe will go into the Wood River-East Chicago section, while salvaged 8-in. from Shell's "North Line," now in operation between Wood River and East Chicago will be used for the East Chicago-Detroit section. The "North Line" was converted from crude oil to products service in 1940.

Construction of diesel-powered pump stations is now in progress, though final decision on station horsepower as yet has not been made. Diesel stations will be operated by semiautomatic controls similar to facilities used on the North Line in recent years. The number of stations on the East Chicago-Detroit section has not been determined.

Although PAD has approved shipment of 6,260 tons of 14-in. pipe for the project for the fourth quarter of this year, no pipe has been received at present. Pipe requirements of the project total 37,855 tons. Completion is scheduled for the third quarter of 1952.

Oil Using More Electricity

HOUSTON. — Oil-industry use of electric power in the Gulf Coast region has increased more than 150 per cent since 1945 and can be expected to climb to 350-400 per cent by 1954, F. M. Austin, vice president of Houston Lighting & Power Co., said this week.

Speaking before the twenty-third annual meeting of the Petroleum Electric Power Association, Austin predicted that the existing shortage of power will extend through 1953, based on anticipated expansion of Gulf Coast industry due to the planned defense effort.

This situation has come about, he said, because users of electric power can increase their demands quicker than power-generation plants can be built to meet them. Efficient utilization of the presently available electric power is essential, Austin said.

T. E. Graham, president of Oklahoma Gas & Electric Co., of Oklahoma City, was elected president of the association for the coming year. Other new officers are Ned W. Beaudreau, Central Power & Light Co., Corpus Christi, vice president; and J. E. Moody, Southwestern Gas & Electric Co., Shreveport, secretary-treasurer.

Platte Awaits Pipe

Company president says big crude line will be operating in July or August next year; urges earlier pipe deliveries

Paul Reed

INDEPENDENCE, Kans.—Platte Pipe Line Co.'s big crude trunk line from Worland, Wyo., to Wood River, Ill., will be ready to pump oil within 2 or 3 weeks after the last joint of pipe leaves the mill, in July or August 1952, Millard K. Neptune, president, said last week.

Platte has asked the Petroleum Administration for Defense to assist in arranging earlier delivery of final pipe shipments. Every month cut from completion time will mean about 3,000,000 bbl. more oil will be available to consuming areas before winter, Neptune said.

So far Platte has laid more than 326 miles of the 1,056-mile trunk. Work on pump stations and river crossings is well advanced.

The project will perform a vital function in the oil-producing program of the United States by providing the first big-inch outlet for crude from the Rocky Mountain area with all the economic advantages that accompany such a system. Foresight of the five companies joined in the venture has already been proved accurate by recent increases in Rocky Mountain exploration and development which promise large reserves beyond those already waiting for low-cost transportation.

The big line would have been completed this year if pipe ordered by Platte had been delivered as originally promised. Diversion of steel to direct defense projects and to the completion of natural-gas lines caused the pipe deliveries to be deferred. The Platte project has now been certified by PAD as essential to national defense, and deliveries of the remainder of the pipe as scheduled are assured.

Pump stations. — All pump stations will be operated by electric power and all stations from Casper east will be served by microwave communication with facilities for remote control.

Increased activity in Wyoming has induced the company to raise initial capacity from 70,000 bbl. daily to 100,000 bbl. daily by adding two more stations, making a total of four main line stations on the 20-in. trunk line. They will be built at Casper, Wyo., Ogallala, Neb., Marysville, Kans., and Salisbury, Mo.

Purchasing problems. — Since the Platte line will be operated as a common carrier not affiliated with a crude-oil-purchasing organization, special arrangements need to be made for equitable adjustment of differences in gravities of crudes received and delivered.

The problem has never been satisfactorily handled except through the use of an affiliated crude-oil-purchasing agency as an intermediary. The problem arises from the fact that the 25 or more Wyoming crudes received into the line will be shipped in three common streams: (1) general, heavy sour crude with composite gravity of 27.3°; (2) special light sour crude of a composite gravity of 36.8°; and (3) sweet crude of a composite gravity of 37.3°.

Gravities for these three streams will range from 19° to more than 40°. Shippers tendering 19° or 30°-gravity sour crude in Wyoming will receive common-stream sour crude of 27.3° gravity at Wood River.

A clearing-house arrangement is being discussed for dealing with the necessary compensations for gravity differences. Representatives of the Interstate Commerce Commission have expressed a willingness to consider a general plan for incorporating provisions for this purpose in the tariff regulations.

Ownership.—Platte Pipe Line Co. is owned as follows: Sinclair Pipe Line Co., 25 per cent; Ohio Oil Co., 25 per cent; Continental Oil Co., 20 per cent; Toronto Pipe Line Co. (British American), 15 per cent; and Pure Oil Co., 15 per cent. In addition to the $6,000,000 subscribed by the stockholders, $54,000,000 has been loaned by insurance companies for the $60,000,000 project.

Other officers of the company are Ralph F. Moore, vice president in charge of construction and operation; K. G. Houghlan, assistant to the president; F. C. Havens, treasurer; Dale Heltzel, attorney; K. T. Feldman, chief engineer; James T. Noel, chief accountant; W. O. Day, purchasing agent; and H. A. Cade, superintendent of right-of-way.

Construction program. — Construction this year has consisted of more than 126 miles of 16-in. laid by R. H. Fulton & Co. to complete the Worland-Casper section and 90 miles of 20-in. east of Casper plus 110 miles of 20-in. by O. R. Burden Construction Co. on the Salisbury-Wood River section.

These two contractors will continue operations until they are forced to stop because of winter conditions.

The other two contractors of middle sections, Bishop & Lock Construction Co. and Rumsey Brothers Pipe Line Construction Co., are expected to start work next spring.

The Mississippi River crossing is being laid by Burden and the Missouri River crossing by Missouri Valley Dredging Co.

Kaiser Steel Co. has completed deliveries of its order of 253 miles of 16 and 20-in. pipe. Youngstown Sheet & Tube Co.'s interrupted shipments will be resumed soon. The remainder of the pipe will be manufactured by A. O. Smith Corp.

"Know-How" Articles—Next Week

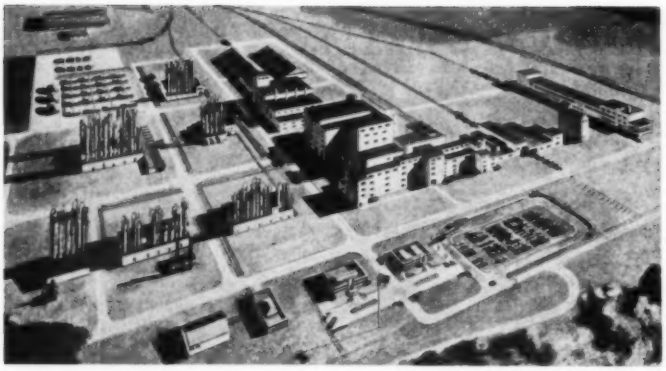
Refining engineering.—Comprehensive discussion detailing modern trends in refinery-gas extraction plants. Phillips Petroleum Co.'s Forrest C. Gilmore and Robert D. Bauer tell (1) how to obtain **high propane-propylene recovery,** (2) how pressure and temperature affect **extraction efficiency,** (3) role of **deethanizing absorber** in improving extraction efficiency, (4) what **plant changes** are needed for high propane recovery.

Spraberry symposium.—Part II installment includes **"Radioactivity Logs** Define Spraberry Lithology," "A **Stimulation** Technique," and "Relation of **Fractures** to the Accumulation of Oil."

Natural gasoline.—Description of Standard Oil Co. of Texas' North Snyder field natural-gasoline plant, Scurry County, by the Journal's West Texas district editor.

Rotary drilling.—Discussion of "crooked holes" and presentation of helpful hints in keeping drilling closer to vertical; by Bruno Scharbarum, general manager, Carl B. King Drilling Co., Midland, Tex.

Corrosion and its control.—Discussion of "Corrosion Rates by Direct Observation," continuation of series by Marshall E. Parker, Houston consultant.



Canada's Biggest

Canada's greatest petrochemical plant now in construction near Edmonton, Alta., will look like this when it is completed about a year hence. The project, to cost over $50,000,000, is being built by Canadian Chemical Co., an affiliate of Celanese Corp. of America. Natural gas from West Canadian fields will be converted in volume production to acetic acid, acetone, acetaldehyde, formaldehyde, and n-butanol. Other products, including pentaerythritol, methanol, propylene glycol, dipropylene glycol, n-propanol and n-propyl acetate will be the first to be produced in Canada. Construction began last June, and due to granting of high materials priorities by the Government, the plant will be completed 1 year earlier than would normally be possible.

Industry Briefs

NEW YORK.—Two new 12,000-gross-ton tankers, the first to be contracted in several months, were ordered last month by Keystone Tankship Corp. from Bethlehem Steel Co. They bring to 28 the total number of tankers now under construction or on order in United States shipyards. Second only to cargo ships in volume of construction, the 28 tankers aggregate 450,250 gross tons and 692,550 deadweight tons. Figures are compiled monthly by Shipbuilders Council of America.

BATON ROUGE.—A record in the number of drilling rigs in operation in Louisiana was set at the end of October, State Conservation Department records show. In addition, two new fields and an increase in drilling permits were recorded. At the end of the month there were 331 rigs running, 71 on wildcat locations, and drilling permits totaled 254, 32 in wildcat areas. Discoveries included South Penn Lake gas field, of Cameron Parish, by Pan Am Producing Co., and Blind Bay oil field in Plaquemines Parish by The Texas Co. October completions totaled 190, including 115 oil wells and 29 gas wells.

WASHINGTON.—Robert T. Haslam, Ethyl Corp. director, has been named a member of a scientific advisory panel of leading scientists, technologists, and educators appointed by Secretary of the Army Frank Pace, Jr., to assist in the solution of military scientific and technical problems.

SEATTLE.—Conversion of a 300-ft. bunkering pier to a barge-loading pier will be completed here next month by General Petroleum Corp. The pier will serve the company's Harbor Island marine terminal and is expected to more efficiently handle increased oil-barge deliveries and permit closed scheduling for other Puget Sound and Alaska points, according to H. A. Baugh, assistant Washington Division operating manager.

WASHINGTON.—Defense Production Administration has allocated 55,000 tons of structural steel to the Petroleum Administration for Defense for first-quarter construction by the oil and gas industry. Requirements of the industry were set by PAD at 71,905 tons, and the allocation represents 76.5 per cent of the amount requested. DPA officials said the structural steel allocations for the first quarter were substantially the same as for the present period.

WASHINGTON. — The Supreme Court has agreed to review the decision of the federal district court at Los Angeles holding that contracts imposed by Richfield Oil Corp. on service-station outlets violated the antitrust laws. The district court ordered the company not to use various termination clauses in its contracts as a means of enforcing restrictive conditions on products to be handled by service stations. Associate Justice Tom Clark disqualified himself from participating in the court's consideration of the case.

LOS ANGELES. — Richfield Oil Corp. has bought a five-story office building in Los Angeles for $1,500,000 for use of the southern division of the company's marketing department. Richfield will continue to occupy the Richfield building, in downtown Los Angeles, where its general office is now located.

Jet Specifications

Airlines want cheap fuel with high B.t.u. content

NEW YORK. — Commercial airlines want a rugged, cheap fuel with the highest possible B.t.u. content for their operations in the coming era of jet-powered aircraft.

J. T. Hendren and J. G. Borger, of Pan American World Airways, Inc., said in a current issue of Esso Air World that fuel now comprises 20 to 25 per cent of an airline's direct-flight cost using aircraft powered by piston engines. The highest fuel requirements of jet operations will boost estimated fuel costs to from 40 to 45 per cent of the total.

Heaviest is best.—The heaviest fuel that can be tolerated from the standpoint of pumpability and combustion characteristics is the best, they say. From economy and safety standpoints, they want no 5-7 lb. vapor-pressure fuels represented by the JP-3 military specification.

No. 6 fuel oil has intriguing possibilities for jet engines, combining wide availability, lack of restrictive of fancy specifications, low cost, and high thermal value. However, the low-temperature handling disadvantages rule it out at least for the time being, and the airlines admit they must settle for a lighter fuel.

Good prospect.—No. 2 fuel oil is presented as a likely candidate, if certain limitations can be overcome. They can—in two ways. Engines can be modified to live with the fuel deficiencies, and fuel specifications could be tightened up just enough to enable the engine to function properly.

The one thing the air-transport industry needs most is a real heavy-duty engine. We need to breed a little of the racehorse blood out of the transport engine and infuse more of the workhorse. The same applies to fuels, and airlines' principal wish seems to be that of avoiding development of a "gold-plated" special fuel with specifications slanted primarily to the high performance necessary in military jet fuels.

Reef Unit Approved

Water-injection pressure-maintenance project in Diamond M field given go-ahead; Lion to begin work immediately

AUSTIN.—The Texas Railroad Commission has approved an operators and royalty-owners unitization agreement for pressure maintenance and secondary recovery of a portion of the Canyon reef formation in Diamond M field of Scurry County, Texas. Lion Oil Co., El Dorado, Ark., will be the operator.

Lion's Diamond M unit includes 12 tracts covering 4,525 productive acres with 112 completed wells. The company owns all operating rights and 92.27 per cent of the royalty interests had signed the agreement at the time of the commission hearing October 19.

Oil recovery would be 20 per cent without pressure maintenance, the commission noted, and evidence indicated a 40 per cent recovery with maintenance.

The application was approved "in all things" by the commissioners, but Olin Culberson, chairman, wrote a concurring statement objecting to the participation factor being based on 75 per cent "gross-reef thickness," contending that the substantial variation in permeability and porosity in the Canyon reef formation makes it obvious that "gross-reef thickness" is not a true criterion of oil in place.

Culberson agreed, however, that the participation factor is a matter for the interested parties to determine among themselves and that the commission's sole job on a unitization agreement is to assure itself that it meets the statute. He warned, however, that the commission was approving a formula with which it might soon be confronted on rule-fixing, and said:

"The commission has studiously avoided consideration of 'sand thickness' in oil formulas heretofore as being 'too conjectural' to be practical."

Rules amended.—The commission then amended rules for Diamond M field insofar as they apply to wells in the area covered by the unit. The new rules adopted for the unit provide that the unit allowable is to be the sum of the allowables of all the wells on it, and it may be produced from any wells on the unit in any manner consistent with efficient operation.

Allowable of a unit well offset by a well outside the unit, however, shall not be increased without a waiver from the operator of the offset outside well.

Lion will be permitted to use any well for injection, with the same waiver requirement if the proposed injection well is offset by a well outside the unit. Water may be produced from any of the wells for injection, or from McLaughlin No. 45. Individual allowables on any wells used for injection or water production may be transferred to any other well or wells producing from the unit. Injection wells will be exempt from gas-oil-ratio surveys or production tests while being so used.

The unit operator, according to the commission order, must file monthly reports by the twentieth of the following month, showing wells used for injection, water production, and how allowables were transferred, and showing any land added to or excluded from the unit. The order also sets out the exact boundaries of the unit as approved.

Hails step.—In El Dorado, T. M. Martin, Lion's president, said that "this is a very important step in the conservation of oil and gas in the Canyon reef horizon. The practice of pressure maintenance and secondary-recovery methods made possible by the unitization agreement will result in a substantially greater ultimate recovery of oil and gas from the unitized area."

Officials of the company have stated that the program of injection of water into the formation will be put into effect immediately with facilities already available, and that Lion will proceed with the installation of necessary equipment for use in gas injection in order to put the pressure-maintenance program into full operation with a minimum of delay.

Pilot projects on water injection by Lion and on gas injection by Lone Star Producing Co. carried out prior to the October hearing "indicate the adaptability of the Canyon reef formation to a program of pressure maintenance using either water or gas or both," a Lion spokesman said.

Production Cut

Texas commission looks at huge stocks above ground, says there's no reason for maintaining record rate of output

AUSTIN.—High stocks of crude aboveground, which led one member of the Texas Railroad Commission to declare that "we are up to our ears in oil," have resulted in a cut in the December allowable by 72,519 bbl. daily.

By maintaining the number of producing days at 23 during the 31-day month of December and continuing production of East Texas field on a 19-day basis, the commission set daily allowable for December at 2,924,918, compared with 3,005,081 bbl. for November. The Bureau of Mines had forecast a demand of 2,780,000 bbl.

E. O. Thompson, commission member, indicated that aboveground stocks of crude were 2,000,000 bbl. above the 260,000,000-bbl. maximum estimate which previous testimony by oil-industry representatives had indicated as necessary. In a statement issued a day before the December allowable was set, Thompson said:

"All products are inordinately high in quantities of storage aboveground . . . Gasoline stocks stand at 109,000,000 bbl. as against 105,000,000 this time last year. Distillates are 102,000,000 as compared with 84,000,000 last year. Kerosine stocks are 33,000,000 against 28,000,000 last year.

"It should be kept in mind that from now till next May gasoline stocks will steadily increase due to less gasoline consumption in the winter months. It should be borne in mind that any time there is a need for additional oil, it can be made immediately available when the demand is shown.

TEXAS CRUDE-OIL ALLOWABLES BY DISTRICTS (BBL.)

Dist.	November	December
1	36,392	36,016
2	174,209	169,058
3	500,448	489,057
4	272,596	265,673
5	56,403	54,913
6 (outside East Texas field)	128,246	127,508
6 (East Texas field)	280,374	271,831
7-B	102,486	100,438
7-C	120,017	116,981
8	1,032,409	1,002,803
9	196,036	192,825
10	97,821	97,815
	2,997,437	2,924,918

Sees no shortage.—"All reports to the contrary notwithstanding, the outlook for the oil-industry supply situation is relatively easy. The very fact that we had to cut our production last month (November) and are faced with definite cuts this month should show to the most doubtful person that

there is no possibility of an oil shortage."

In addition to the 19-day allowable for East Texas, other special situations led the commission to set 14 producing days for Pantex field, 10 for Pickton field, and 16 for Hawkins field. The last was added to the special list following testimony by Humble Oil & Refining Co. that pipeline and gasoline-plant capacity in the field limited it to 16 days' production.

Second cut.—The new allowable reflects the second cut in a 2-month period. November's 3,005,081-bbl. allowable was 110,431 bbl. daily under the 3,115,512 bbl. allowed for October.

Much testimony was presented to the commission regarding the number of days to be allowed for statewide production, but most representatives voiced approval in the final figure.

Companies registering exception to the lower rate were Humble Oil & Refining Co. and Sun Oil Co. with support from Crown Central Petroleum Corp. of Houston.

Although both Sun and Humble admitted to the existence of heavy stocks of crude oil, Herman Pressley, Humble attorney, said the problem was one of distribution rather than of total stocks. He pointed out that the greater part of the increase was in the Midwest, Rocky Mountains, and West Texas.

He told the commission that all pipe lines from West Texas to the Gulf Coast were operating at capacity, but that 40,000 bbl. of idle space exists to the north.

J. A. Neath, Humble vice president and director, told the commission his firm would like to move 20,000 to 30,000 bbl. a day more from West Texas to the Gulf Coast if the oil could be handled.

Members of the commission, after hearing testimony on the fact that crude-stock figures might be "out of date," agreed it might be a good idea to redetermine at some future hearing the desirable level of national stocks of oil and products. The commission indicated that presidents and board chairmen of major producing companies may be invited for this purpose at the next statewide proration hearing, set for 9 a.m. December 19 in the Commodore Hotel in Austin.

Umbrella may break.—After reading messages from several operators on their producing nominations, Olin Culberson, commission chairman said:

"It strikes me that this great big umbrella (of Texas reserve production) is going to break some day."

He cited the Texas increases to take up the slack when the Petroleum Administration for Defense's estimates of demand were shy and when Iran closed down. He said he doubted the wisdom of increasing Texas production beyond what is absolutely necessary when Texas is carrying 75 per cent or more than its share of the increase.

MID-CONTINENT

New Flood Begun

Water injection started in Mid-Burbank unit; operators expect additional recovery of 20 per cent of oil in place

Joseph A. Kornfeld

TULSA.—The second major waterflood program for the Osage Nation was officially inaugurated 5 miles south of Shidler, Okla., last week by Paul Pitts, principal chief of the Osage Tribal Council and William Wikoff Smith, president of Kewanee Oil Co.

The two leaders turned valves that sent water flowing into injection wells scattered throughout the Mid-Burbank Unit, a 1,600-acre segment of the Stanley sand bar lying east of the main Burbank field. *(See The Oil and Gas Journal, April 19, page 132).* Kewanee, with a 48.8 per cent interest, is operator for itself and three other companies, Skelly Oil Co. (26.1 per cent), The Texas Co. (22.3 per cent), and Gulf Oil Corp. 2.8 per cent).

An additional 5,000,000 bbl., or 20 per cent of the oil in place, is expected to be recovered by application of the water-flooding program. Production which has averaged about 150 bbl. per day from 40 wells, is expected to be boosted to about 5,000 bbl. per day by mid-1953.

Water source.—Over 50 million barrels of water will be required to conduct the flooding program during the next 10 years, which means an injection rate of from 15,000 to 20,000 bbl. per day.

TURNING IT ON.—Paul Pitts, left, principal chief of the Osage Tribal Council, Pawhuska, and William Wikoff Smith, president of Kewanee Oil Co., Philadelphia, are shown above as they opened a valve on a water-supply line, turning water into the Burbank sand reservoir at Mid-Burbank Unit last week.

One-half of this volume is to be obtained from the Arkansas River, through the 10¾-in. pipe-line system of the Ark-Burbank Water Flood System. This is a new water-gathering and distribution system extending from Kaw, Okla., throughout the Burbank fields. Reclaimed produced water will furnish the remainder of the water needed.

Water behind gas.—The water-flooding project follows a successful gas-repressuring program in several sectors of the Stanley stringer and the adjoining North and South Burbank fields for the past 15 years.

The Mid-Burbank sector has been an exceptionally well developed producing area. A prolonged flowing life during the early production history was due to early application of a gas-injection program, development under a 20-acre spacing rule and use of an exacting proration formula to enforce this spacing. Under these favorable conditions, a creditable flowing life was achieved and pressure decline was retarded from the original reservoir pressure of 800 psig.

Ultimately 49 oil wells were drilled on an average density of 17.5 acres per well. Through primary production control and gas repressuring, a recovery of 5,891,485 bbl. was obtained to November 1, 1951; this represents a recovery of 6,835 bbl. per productive acre or 187 bbl. per acre foot.

Sand characteristics.—The Burbank sand is a depositional sand bar which was deposited along the shores of an ancient Pennsylvanian sea during Cherokee geologic time. Subsequently, tectonic action tilted the formation, resulting in a monoclinal structure with westerly dip of about 30 ft. per mile. In general, the sand bars are shale-bounded and limited in area which precludes the existence of water in any appreciable quantity. The producing sand, which lies at a depth of about 2,900 ft., is composed of very fine to medium angular to subangular quartz grains. The effective thickness of the producing section ranges from zero to 80 ft., depending upon the degree of redeposition and extensiveness of shale partings or impermeable streaks. Average porosity is 18 per cent and average permeability 134 md.

Unit formation.—The four companies, owning 1,600 acres in Sections 23, 26, 27, and 35 in Township 26n-6e, joined in signing the unit agreement on October 1, 1950. Ratification of the unitization and water-flooding agreement by the Osage Tribal Council, the Osage Indian Agency, and the Department of the Interior was completed by December 19, 1950, and the unit was placed in operation by January 2, 1951.

Injection-well pattern.—Twenty-four new wells subsequently were drilled for the water-flood plan to achieve an over-all density of 8.6 acres per well. The ultimate effect of this program resulted in a ratio of 1.2 producing wells to each injection well. Of the total of 73 wells drilled, 34 were converted to injection use. Daily water-injection rates will range from 441 to 588 bbl. per well.

Since the flood-pattern design involved the use of old wells, an extensive remedial program was conducted early in 1951 to convert pattern locations to injection. The wells were first cleaned out to bottom and electrically surveyed to determine the top section and porous zone, base of sand, casing seat, and diameter of bore.

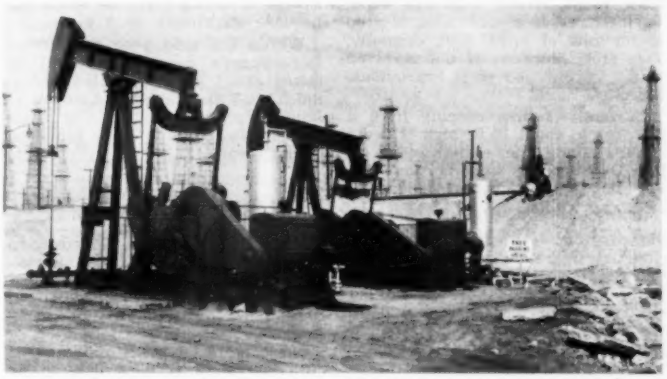
Any suspected thiefing zones in the Burbank section, such as shale or depleted gas strata, were squeezed off subsequently with cement; in some instances 5½-in. o.d. liners were cemented to exclude effectively gas or depleted zones of high permeability.

Water-dispersion system.—To transmit the water from the filter plant to the most remote injection well in the unit with a minimum loss in pressure posed a design problem. Accordingly, a system was devised to incorporate two 4-in. parallel lines to the field header points. Through this arrangement provision is now available to convey pressure fluid on one segment while still retaining the pressure from the filter plant on the other. Flexibility of the system permits one segment to be used for the transmission of fresh water while the other conveys produced water.

The headers are assembled in a vertical arrangement for both the oil and water flow systems. The compactness of the circumferential lines permits ease of access to meters and control valves and coverage by a weatherproofing housing.

Pumping units.—Two sizes of pumping units were selected for replacement of small capacity jacks formerly used with central powers. On the edge wells where flood stimulation would be minimized, 2 hp. gear-powered pumping units with individual electric motors were installed whereas throughout the center of the unit area where higher injectivity rates were planned and the sand section was well developed, 1-hp. units were employed.

WEST COAST



PUMPER PROTECTION.—Workmen in the background may be seen erecting a dike around these two wells, located along the east edge of Pier D. The pumpers, themselves, probably will be elevated about 12 ft. within the next year to bring the well sites up to the level of the dike.

Subsidence Problem

Long Beach begins expensive program to build dikes, fill low areas to keep valuable Wilmington field above ocean

D. H. Stormont

LONG BEACH.—The city of Long Beach, which enjoys an income of about $30,000,000 annually from 800-odd oil wells in Wilmington field, is taking steps to insure that this bonanza is not jeopardized by continued land subsidence.

Through the Harbor Department, supervising agency for its tideland oil operations, the city has started a huge dike-building and earth-filling project which probably will cost between $15,000,000 and $20,000,000.

It will involve elevating some areas as much as 18 ft. In addition, many oil lines will have to be relaid, and the surface equipment of a great number of producing wells will have to be elevated. Even the department's headquarters building is to be jacked up some 10 ft.

Seepage problem.—While subsidence at city properties has not been as severe as at the center of the sinking area, some portions are below high-tide levels. This is particularly true near the intersection of Embarcadero Street and the entrance channel. There, during periods of high tide, water seeps up through the ground and transforms low areas into small lakes.

At the center of the subsidence

THREATENED BY OCEAN.—This building, headquarters of the Long Beach Harbor Department, will be jacked up 10 ft. in the current program to combat subsidence. Ground floor of the building now is at water level when there is a 7-ft. tide, and the ground is still sinking.

area, near the junction of entrance and Cerritos channels, the surface has dropped almost 15 ft. and is more than 10 ft. below high-tide level. Furthermore, it is continuing to drop at the rate of about 2 ft. annually. This area, however, is not involved in the current job as it lies outside the city's lands.

Currently a dike ranging from a few feet to about 18 ft. high is being erected along the eastern edge of Pier D. When this work is completed the dike along the western edge will be raised similarly.

Pier program.—Although not fully decided at this time, it is anticipated that the interior of the pier will then be brought to grade. If so, the 140 producing wells on the pier will be elevated to the new level. If not, a system of well points will have to be installed to keep the ground-water level below the surface.

Similar work then will be carried out along the base of this and the other piers, seaward of Seaside Boulevard and between the entrance channel and Los Angeles flood-control channel. Because of their more recent construction and the fact less subsidence is taking place, no work will be done on Victory or A piers.

Within the next year the Harbor Department's headquarters will be raised about 10 ft. High tides of as much as 7 ft. are quite common at Long Beach, so that during these periods the building is at the level of the ocean.

Elk Hills Project Set

SAN FRANCISCO. — Construction on the $7,000,000, 50,000 M.c.f. natural-gasoline plant at the Elk Hills Naval Petroleum Reserve is scheduled to start late in December or early January.

The compressor plant of the existing 5 000 M.c.f. plant also is to be enlarged. Standard Oil Co. of California, as operator of the unit project, is in charge of the new construction, which has been contracted to Parsons-Macco Co., Los Angeles.

NATIONAL AFFAIRS

Tidelands Tampering

Texas senator warns that any federal effort to take over offshore development will draw congressional retaliation

WASHINGTON.—Any attempt on the part of the Interior Department to take over development of the Gulf tidelands oil deposits will bring quick retaliatory action from Congress, the administration has been warned.

High-level conferences between Interior and Justice officials have been going on for some time, apparently with approval from the White House, and Sen. Lyndon B. Johnson of Texas challenged President Truman last week to make his position on the issue clear.

In a letter to the President, Johnson emphasized the Congress has never passed legislation authorizing department administration. He characterized as "shocking" the theory that authority to make leases was granted by the Surplus Property Act of 1949, which is reported to be one of three possible ways now under study by the department in its drive to take over.

"Legislation clarifying the title to the tidelands is now before Congress, and I feel that it would be an unthinkable display of contempt for Congress and for the states, if a department of the federal Government should now attempt to circumvent a forthright and open settlement of the question.

"I hope that you may find occasion to reaffirm your traditional position that matters such as this should be settled by Congress and give your assurance that no federal assertion to control over the tidelands will be made without a clear-cut determination of national policy by Congress," Johnson told the President.

Interior reluctance. — Department officials were reluctant to discuss the matter, although they admitted conversations with the Department of Justice are still going on.

While it was said that Secretary Oscar L. Chapman felt he had ample authority to act under any one of several laws, it was conceded that the most important factor to be considered is the reaction of Congress and the public, particularly in the southern states.

Three laws from which authority might be secured have been under study, one of them the Surplus Property Act and the others the provisions for industrial expansion in the Defense Production Act and the authority held by the President to set aside naval petroleum reserves. However, it was stressed, no decisions have been made.

Political implications. — While there apparently is fear in the Interior Department that precipitate action might result in quick passage of quitclaim legislation by Congress, even in the face of a presidential veto, the political future of Atty. Gen. J. Howard McGrath might also be imperiled. McGrath reportedly is slated to be appointed a member of the Supreme Court when the next vacancy occurs. McGrath's approval of any attempt to bypass Congress in the tidelands matter, accordingly, would make it difficult for him to secure Senate confirmation to the court seat.

None satisfactory.—The department's search for existing law under which to exercise its authority over the tidelands was actuated by the failure of Congress to declare itself, according to Mastin G. White, department solicitor.

In a letter to Rep. J. Frank Wilson of Texas, White said this search indicated that none of the statutes administered by the department could be utilized for the administration of the oil and gas deposits in the submerged lands.

"It seems to be clear that the inauguration of a program for the full-scale development of these oil and gas deposits would be beyond the scope of the inherent power of the executive branch to act for the protection and conservation of the property, and that it could be undertaken only if statutory authority for such a program could be found in existing legislation or obtained from the Congress in the form of new legislation," White said.

"So far as I am aware, there has never been any disposition upon the part of any responsible official of the executive branch to act without statutory authority in embarking upon a program of full-scale development of the oil and gas deposits in the submerged lands of the Continental Shelf beneath the Gulf of Mexico," he declared.

In other quarters, it was said that the department will not attempt to exert any authority over the tidelands this year, an indication that officials believe it would be unwise to take action while Congress was out of the city so briefly. Congress is scheduled to meet January 8.

Drilling-Data Release

WASHINGTON.—Oil and gas producers are being asked by the Petroleum Administration for Defense to permit publication of over-all figures on well-drilling programs and inventories of oil-country tubular goods.

Telegrams have been sent out to 153 of the larger producers explaining that for "policy reasons," PAD deems it advisable to publish the quarterly allocations to individual operators to "allay questions as to equitable treatment" between large and small recipients of tubular goods.

However, Deputy Administrator Bruce K. Brown explained, there are

WATCHING WASHINGTON

Bertram F. Linz

Credit Pattern

A definite pattern for extension of loans to industry is gradually being developed by the National Voluntary Credit Restraint Committee through the decisions of regional groups to which loan applications are being referred by lending institutions.

The purpose of the committee is to guide banks and other lenders in dealing with applications, so as to restrict credit for nonessential purposes.

Already, several cases involving oil have come up and regional committees have been given favorable reports on applications of tankship owners to purchase oil tankers for charter to oil companies and on those of wholesale petroleum dealers to buy tractor-tanker units, both for replacement and for additional service.

A favorable report also has been rendered in the case of a retail fuel dealer seeking a loan to purchase 1,000,000 gal. of fuel oil in advance of the heating season. Unfavorable reports were made in the cases of a service-station operator seeking funds for modernization of equipment and facilities and in another case where an operator planned to equip a new self-service station in a community where existing facilities were adequate.

Not Satisfied

National Petroleum Council figures on the cost of producing gasoline by coal hydrogenation, based on an independent study, will be countered by Secretary of the Interior Oscar L. Chapman with an independent study of his own, to be conducted for the department by Ebasco Services, Inc., New York.

The council study, on which the industry expended in excess of $300,000, placed the cost of coal hydrogenation at from 41.4 to 43.5 cents per gallon while the Bureau of Mines' latest figures put it at 10.75 to 10.9 cents.

Apparently anticipating a wide spread between the council and the bureau, the latter started negotiations with Ebasco Services early in October but did not disclose its plans until 2 weeks after the council meeting, at which the reports were submitted.

The Ebasco study will be based on a hypothetical 30,000-bbl. per day plant at Rock Springs, Wyo., and a similar plant in Union County, Kentucky, and will include investigations of the need for additional housing in those areas; items of operating costs, particularly maintenance and return on investment; labor requirements for each plant; methods of financing; marketing of by-products; and other factors which the council committee said had either been ignored or played down in the bureau's original computations.

The study, scheduled to be completed early next year, is designed to determine the average required wholesale selling price of gasoline and liquefied petroleum gas produced by coal-hydrogenation plants over the life of the project, based on costs of January 1, 1951, and current selling prices of byproducts.

Big Cooperatives

Farmer cooperatives are now in the class of "big oil" with sales last year estimated at $300,000,000.

Because the business is split between a large number of associations, the full extent of their operations is not readily apparent. But a Department of Agriculture study shows that 1,000,000 farmers bought their petroleum products through cooperatives in 1950 for a total of some 33,500,000 bbl. of fuels, well over 400,000 bbl. of lubricating oil, and about 17,400,000 lb. of grease.

Cooperative sales are estimated to account for about 16 per cent of all liquid-petroleum fuels and 10 per cent of all lubricating oils and greases used on American farms.

There are approximately 2,230 local cooperatives handling liquid-petroleum products. They have 2,685 bulk plants, 2,000 service stations, and 5,660 tank trucks for distributing fuels to farms.

Currently, the cooperatives are getting into the growing field of liquefied-petroleum gas, handling about 15,000,000 gal. last year.

More significant perhaps than the growth of cooperatives in the last quarter century is the shift to mechanized agriculture in the same short period. While it is true there are still more horses than tractors on farms, the mechanized mule does many times as much work as the draft animal.

over 3,000 individual operators, which would make tabulations unwieldy, and the purposes of publication will be served by disclosing the allocations to the 153 Class B operators, who historically drill 40 or more wells per year. This would be accompanied by the total allocations for the other groups—those drilling between 11 and 40 wells per year and those drilling less than 11.

Brown pointed out that this information would be of little value without data on past and future drilling programs and inventories. The past and forward drilling programs would be published only by total wells and footages, and the operators' inventories would be as reported to PAD.

Brown assured the operators PAD will not voluntarily publish any figures except actual-tonnage allocations without their express permission.

ECA Oil Aid

O.K.'d procurements total more than $1,250,000,000

WASHINGTON. — Procurement authorization for crude and products issued by the Economic Cooperation Administration to the Marshall Plan countries reached 1¼ billion dollars at the close of the fiscal year last June 30.

The $1,249,300,000 earmarked for oil represented more than 10 per cent of the $11,879,500,000 distributed under the Marshall Plan between April 3, 1948, and June 30, 1951, it is disclosed in the thirteenth ECA report to Congress.

Less than one-fourth of the oil received by the countries participating in the program originated in the United States. The larger part was shipped in 1948-49, before Middle East operations were great enough to take over a steadily increasing portion of the load.

Authorizations for U. S. oil totaled $310,500,000 during the 39-month period, while orders for Middle East oil amounted to $480,600,000, the participating countries $304,700,000, Latin America $153,300,000, and Canada $100,000.

Distribution.—Distribution of the authorizations was as follows: Austria, $3,600,000; Belgium-Luxembourg, $60,000,000; Denmark, $56,200,000; France, $380,900,000; Germany, $54,600,000; Greece, $21,300,000; Iceland, $3,200,000; Ireland, $13,300,000; Italy, $130,700,000; Netherlands, $64,900,000; Norway, $36,100,000; Portugal, $8,600,000; Sweden, $67,200,000; Trieste, $12,900,000; Turkey, $5,000,000; United Kingdom, $331,100,000; Yugoslavia, $2,300,000.

During the first year of the Mutual Defense Assistance Program, authorizations were issued for $3,469,000 worth of United States oil, of which

$1,786,000 was to Turkey, $1,083,000 to Yugoslavia, and $600,000 to Italy. Authorizations also were issued for $105,000 worth of crude and products from Mexico, and $1,063,000 worth from the Middle East, all to Yugoslavia.

In addition to supplying petroleum, ECA issued guaranties in the amount of $19,118,000 for refining projects in Italy and $2,025,000 for carbon-black facilities in England, plus another $550,000 for forward contracting of refinery projects in Italy.

Next Year's Steel

PAD turns down third of applicants for casing, tubing in first quarter; 302,000 tons allocated to 1,855 users

WASHINGTON.—Only 1,855 of 2,881 oil and gas operators qualified on initial application for allotments of oil-well casing and tubing for the first quarter of 1952.

They will receive a total of approximately 302,000 tons out of an allotment of 466,000 tons given the Petroleum Administration for Defense by the Defense Production Administration.

The allocation for drill pipe is not yet firm and has not been announced, but is expected to be in the neighborhood of 30,000 tons.

Approximately one-third of the 1,026 applications which were not approved were defective, and the remainder were denied because the applicants did not qualify for primary allotments. The latter, including those who are new in the business and have no previous history of drilling, were given 2 weeks in which to file new applications for supplemental allotments from some 35,000 tons set aside for that purpose.

While PAD earmarked 409,250 tons of its allotment for domestic operations and 56,750 tons for activities outside the United States, actual allocations for the former were reduced to allow for mill slippages of about 50,000 tons during the third and fourth quarters of this year. Allocations for foreign use may have to be cut 10 per cent because of short supplies of steel and the inability of mills to meet all demands.

Domestic breakdown.—In distributing its tubular goods, PAD made 272,000 tons available to operators drilling more than 11 wells during a 12-month period and will place about 30,000 tons in field stocks to meet the normal development requirements of operators drilling fewer than 11 wells. Another 22,200 tons will be set aside in 13 regional warehouse centers for emergency use by operators drilling wildcats, and the 35,000 tons remaining after the deduction for slippage was set aside for supplemental allotments.

Tentative allocations of 46,750 tons have been assigned for foreign operations and 10,000 tons for Canada.

Field stocks.—The field stocks will be distributed at the rate of 7,400 tons a month through 23 supply houses, as follows:

Los Angeles: Oil Well Supply Co., 300 tons; Youngstown Steel Products Co., 200 tons; Hillman Kelly Co., 200 tons. Casper, Wyo.: National Supply Co., 400 tons; Continental Supply Co., 500 tons. Ellinwood, Kans.: Continental Supply Co., 300 tons. Great Bend, Kans.: Bovaird Supply Co., 300 tons. Grayville, Ill.: Bethlehem Steel Co., 350 tons.

Oklahoma City: Franklin Supply Co., 100 tons; Jones & Laughlin Supply Co., 300 tons; Republic Supply Co., 200 tons. Mount Pleasant, Mich.: Jones & Laughlin Supply Co., 200 tons. Houston: Continental Supply Co., 200 tons; Jones & Laughlin Supply Co., 200 tons. Alice, Tex.: Oil Well Supply Co., 300 tons.

Odessa, Tex.: Mid-Continent Supply Co., 500 tons; National Supply Co., 500 tons; Oil Well Supply Co., 500 tons. Wichita Falls, Tex.: Industrial Supply Co., 400 tons. Harvey, La.: Murray Brooks, Inc., 400 tons. Charleston, W. Va.: McJunkin Supply Co., 250 tons. Ballinger, Tex.: Jones & Laughlin Supply Co., 300 tons.

New standards.—The first-quarter allocations were made under new standards approved by Deputy Administrator Bruce K. Brown October 1. The basic breakdown previously followed is continued, with the emergency allotment of 5 per cent of the available casing, tubing, and drill pipe set aside in field stocks and 75 per cent of all casing and tubing and 90 per cent of all drill pipe made available for primary allotments to operators.

The primary allotments are divided equitably between so-called Class A operators who drill not more than 40 wells in the four quarters preceding that for which an application is made, and Class B operators who drill more than 40 wells. Class A is subdivided into two groups, those who drill between 11 and 40 wells who are given specific assignments of tonnage to be obtained from their normal suppliers, and those who drill not more than 11 wells being given letters advising them of the maximum tonnage of steel they may obtain by filling Form PAD-15 for use in their operations during the quarter.

The tonnage allotted each operator, regardless of class, is determined on the basis of his previous drilling history, his planned drilling program, and the amount of tubular goods he has in inventory. The equivalent of a 90-day working inventory is considered adequate for an operator's needs, and, if his inventory exceeds that amount, the excess is subtracted from the allotment of tubular goods he would otherwise receive.

"No history" allotments.—In distributing tubular goods available for supplemental allotments, qualified operators who have not recently undertaken oil or gas-drilling operations (so-called "no history" operators) are given first consideration. Whatever tubular goods is left in the supplemental allowance is distributed on a proportionate basis to Class A and B operators who file applications for supplemental allotments.

Emergency allotments of tubular goods from field stocks are made on the basis of a system of priorities. Wildcat wells are given top priority, and thus far the supplies available have not been sufficient to permit allotments for any other operations. However, if sufficient tubular goods becomes available, the priority list will be extended to extension wells, offset wells, and drilling-obligation wells, in that order.

Brown to Head Committee

WASHINGTON.—Russell B. Brown, general counsel of the Independent Petroleum Association of America, has been named chairman of a committee on oil-country tubular goods set up by Walter S. Hallanan, chairman of the National Petroleum Council, to undertake a study requested by the Interior Department.

The study is designed to determine the most desirable range of sizes and weights of tubular goods for present needs in production operations and the relative proportion of each expressed in terms of footage and tonnage.

The department requested the study because of indications that the increased use of rotary rigs and deeper drilling have expanded the requirements for the smaller sizes of sacing and have outmoded the pipe-mill production patterns based on shallow wells and cable-tool drilling.

B.L.M. Revises Lease Rules

WASHINGTON.—Regulations governing the issuance of oil and gas leases on acquired lands have been revised by the Bureau of Land Management.

Future fractional interest leases, whether the future interest of the United States is whole or fractional, will be issued only to applicants who show that they own all or substan-

tially all of the present operating rights in the land covered by the application.

Applicants will be required to execute an agreement providing for the payment of annual rental in advance at the rate of 25 cents an acre for each tract until the future interest therein becomes possessory or until production is established. After the discovery, and until the lease becomes effective as to the respective tracts, the agreement calls for the payment of a royalty on production not less than 25 cents per acre per annum at the particular rate that is applicable under a certain scale. This scale provides for 5 per cent when the interval from the date of receipt of the application to the date that the future interest will become possessory is not more than 5 years; 4 per cent where it is 5 to 10 years; 3 per cent where 10 to 15 years; and 1 per cent where more than 15 years.

The agreement is provided in a new form 4-1155 adopted by the department.

Projects O.K.'d

Accelerated amortization is set for oil facilities

WASHINGTON.—New petroleum facilities to cost close to $90,000,000 have been given certificates of accelerated amortization since the moratorium on the issuance of certificates by the Defense Production Administration was lifted October 18.

With the issuance of these certificates the total of new facilities for all types of defense and defense-supporting activities aided by quick write-off of investment topped the $10,000,000,000 mark, covering 4,384 projects.

The largest oil project approved since the issuance of certificates was resumed is a $43,107,000 plant for the production of aviation gasoline, to be built by Richfield Oil Corp. at Los Angeles. For this project, DPA has approved 90 per cent amortization for $4,399,000 of the cost, 65 per cent for $23,643,000, 45 per cent for $12,765,000, and 15 per cent for $2,300,000.

The next largest project is a $19,432,000 refinery for gasoline production to be built at Texas City, Tex., by Pan American Refining Corp. for which it has been granted 90 per cent on $667,000, 65 per cent on $8,835,000, 45 per cent on $6,415,000, and 15 per cent on $2,757,500, with the remainder subject to normal amortization. A third big project is the $12,310,000 plant for aviation gasoline to be built at Bartlesville, Okla., by Cities Service Oil Co. for which 90 per cent has been granted on $1,100,000, 65 per cent on $9,038,000, and 45 per cent on $2,172,000.

Avgas projects.—Several other multimillion-dollar aviation-gasoline projects have been approved, including a $4,210,000 plant at East Chicago, Ind., for which Socony-Vacuum Oil Co., Inc., was granted 90 per cent on $3,363,000 and 45 per cent on the remaining $847,000; a $3,000,000 plant at Long Beach, Calif., for which Hancock Oil Co. of California was given 90 and 45 per cent on an undisclosed split, and a $2,000,000 plant at Corpus Christi, for which Pontiac Refining Corp. was granted 65 per cent on $1,790,000 and 40 per cent on $210,000. Other aviation-gasoline projects approved were two facilities, to cost $460,000 and $110,000, respectively, to be built at Baytown, Tex., by Humble Oil & Refining Co., for which 90 per cent amortization was granted.

Benzene facilities.—Certificates also have been issued for a $1,187,000 benzene project of Standard Oil Co. of California at Richmond, Calif., for which 90 per cent was granted on $1,079,400 and 45 per cent on $107,600; a $400,000 plant for hydrogen sulfide at Avon, Calif., for which Tide Water Associated Oil Co. was granted 70 per cent; a $3,400,000 facilities for benzene, toluene, and xylene to be built at Cushing, Okla., by Deep Rock Oil Corp., which will get 90 per cent on $1,550,000, 65 per cent on $2,172,000, and 45 per cent on $175,000; a $4,000,000 facility for chemical-grade benzene and toluene at Corpus Christi, on which Great Southern Chemical Co. was given 90 per cent on $1,200,000, 65 per cent on $2,150,000, 45 per cent on $600,000, and 15 per cent on $50,000.

Other plants.—Two isobutane plants, one for Hugoton Plains Gas & Oil Co. at Tyrone, Okla., to cost $119,250 and the other for Panoma Corp. in Texas County, Oklahoma, to cost $211,400, were given certificates for 90 per cent. Five natural-gasoline projects also were approved, with Phillips Petroleum Co. getting 65 per cent for $33,270 and 40 per cent for $42,110 of an $80,820 facility in Ector County, Texas; 45 per cent of $157,630 on a $167,160 facility in Crane County, Texas; 65 per cent for $169,165 of a $186,000 facility in Hutchinson County, Texas; and $1,007,225 of a $1,107,960 facility in Moore County, Texas, and 40 per cent for $75,005 of a $78,880 facility in Hutchinson, Moore, and Gray counties, Texas.

Minerals Division Created

WASHINGTON.—Development and leasing of oil and minerals on the public domain has been centralized in a new division of minerals set up in the Bureau of Land Management, with Lewis E. Hoffman at its head.

The new division, and another to handle matters other than oil and minerals, will supersede the division of adjudication, which has been abolished.

Hoffman, who joined the department in 1914 and since 1946 has been chief of the minerals branch in the division of adjudication, will have general supervision over oil and gas leases but there will be no change in the manner in which applications are processed, either in the field or in Washington.

The purpose of the reorganization is to facilitate oil, gas, and mineral development on the public lands.

GULF COAST

Methanol Plant Planned

HOUSTON.—A new $12,000,000 plant for the production of methanol will be built on the Houston Ship Channel by Heyden Chemical Corp., New York, according to Simon Askin, vice president.

Construction is expected to begin early in 1952, although no building contracts have been signed as yet.

Methanol (methyl alcohol) is produced from methane by oxidation and the Fischer-Tropsch process and is used as the starting material for the manufacture of many other organic substances.

MEETINGS

Smith to Address Compact

LITTLE ROCK.—Conservation aspects of the depletion allowance will be one of the subjects taken up at the winter meeting here December 11-12 of the Interstate Oil Compact Commission.

Speaker who will discuss the subject will be Clarence T. Smith, Flora, Ill., independent operator and Illinois representative on the Compact. Smith will speak during the general session on the second day of the 2-day convention.

The first day of the meeting will be devoted to all-day meetings of the standing committees of the Compact.

Scientific Meeting Set

Several sessions of interest to geologists and other petroleum technologists are scheduled during the annual meeting of the American Association for the Advancement of Science December 27 and 28 in Philadelphia.

The meetings of Section E (geology and geography) are as follows: December 27: general geology, morning and afternoon; geography, morning and afternoon; water supply and conservation, afternoon; evening, vice presidential address and smoker at Bryn Mawr College. December 28: crystalline rocks of the Appalachians, morning and afternoon; foreign petroleum geology, morning and afternoon.

For the petroleum industry, particular attention has been drawn to the foreign oil program December 28.

Instrument Course Held

LOS ANGELES.—A 3-day short course designed to help increase the efficiency of instrument maintenance was held here November 15-17 at Los Angeles Harbor Junior College.

The first such course ever held in California, the meeting was jointly sponsored by the college and Southern California Meter Association. Some 250 instrument and meter men were in attendance to hear the more than 20 papers given during five sessions. James A. Serey, Jr., of Southwest Exploration Co., Huntington Beach, was chairman of the committee which prepared the program.

ROCKY MOUNTAIN

Misleading Outlook

Hallanan tells Rocky Mountain men things aren't as good as they appear in the oil industry, urges more drilling

DENVER. — The beautiful picture painted by record productivity, profits, reserves, and drilling activity is a mirage, Walter S. Hallanan, president of Plymouth Oil Co., warned here last week.

Addressing the annual meeting of the Rocky Mountain Oil and Gas Association, Hallanan said that while the oil industry may seem to be riding the crest of a wave, there are many aspects of current oil operations which should cause oil men to consider seriously their industry's future.

"In terms of number," Hallanan said, "it is true that we are drilling more wells than ever before, but when we measure our drilling operations in terms of increased production, we are not even keeping pace with last year."

Although it would appear that there will be a world surplus of oil when production is resumed in Iran, Hallanan said, the industry cannot afford to slacken its efforts.

"We must drill more and more wells, explore more new horizons, and build up even greater reserves if America is to be self-sufficient in the all-important matter of oil. We dare not risk the destiny of this great land upon oil 3,000 miles away. We must have the oil here at home, and we must have the facilities to produce, transport, and process it."

Profits misleading.—While profits are at an all-time high, he continued, the profit picture is "completely distorted" in that the petroleum industry's income bears no relationship to replacement costs. "If we properly considered replacement costs, at least one-half of the industry's profits would disappear," he said, pointing out that half of the nation's oil production comes from fields discovered and developed 10 to 20 years ago at costs far below those of today.

Turning to the subject of price, Hallanan declared that it has been 4 years since the price of crude has been increased, while during that period "the price of every other commodity has skyrocketed and the cost of everything the oil industry buys—labor and materials—has been enormously increased."

Price, he added, is linked directly with conservation and exploration, both of which he termed essential to the maintenance of reserves and national security.

Future bright.—S. F. Bowlby, vice president of Shell Oil Co., told the association that the Rocky Mountain area holds great promise for the oil industry. "We now know that vast new oil provinces have been added to those which already produce. What we are not yet sure of is the limit we can place on our hopes and dreams."

The petroleum resources of the nation as a whole, he said, still are far from known.

"It is impossible," he declared, "even to guess at the oil still to be discovered in this country. Deeper drilling, the seismograph, the airborne magnetometer, and all the other new tools and exploration techniques, may well discover new fields which might have been beyond our reach even 10 years ago."

New officers.—Charles S. Hill was reelected president of the association during the annual business meeting.

New vice presidents elected were J. D. Dougan, Equity Oil Co., Salt Lake City; A. F. Barrett, General Petroleum Corp., Casper; and W. M. Saxon, Billings. G. J. Mueller, Argo Oil Corp., Denver, was reelected a vice president, and Walter G. Davis, Casper, was reelected treasurer.

Colorado Rules Meeting Set

DENVER.—Colorado's recently created Oil and Gas Conservation Commission will meet here November 29 to consider proposed rules and regulations which will govern operations of the petroleum industry in the state.

The regulations cover the duties of the director, Joseph J. Zorichak, reporting by operators, drilling, development, producing and abandonment, unit operations, and secondary-recovery projects.

Bonanza Sale Pending

OMAHA.—A group of Texans headed by Leland Fikes, Dallas, is negotiating for purchase of Bonanza Oil Co. at a price estimated at approximately $20,000,000.

Holders of the firm's outstanding 980,000 share of stock have agreed to the sale, and purchase should be completed this month, Dr. Victor Ziegler, Bonanza president announced last week.

The company has 10 flowing wells in Bonanza field near Worland, Wyo., capable of producing 25,000 to 30,000 bbl. a day. The discovery well, Victor Ziegler 1, was brought in last December.

Ziegler claims that the field has the highest potential of oil per acre of any field opened in the Rocky Mountain area. Oil is produced from the Tensleep sand with 150 to 180 ft. of pay. Porosity runs to 30 per cent in some of the sand.

William L. Less, president of D. H. Ellis Co., New York financial firm, has been instrumental in negotiating the purchase contract and has an interest in it.

Stanolind to Enter Williston

Stanolind Oil Purchasing Co. will enter the Williston basin area of the Dakotas and eastern Montana as a crude-oil purchaser and marketer on December 1.

D. L. Wolfe, executive vice president, said Stanolind will begin buying production in Beaver Lodge field, near Tioga, N. D., on that date.

The company will resell part of the crude to Standard Oil Co. (Ind.) for processing in its Whiting, Ind., refinery, and the rest will be sold to other refiners. Stanolind Oil Purchasing is a wholly owned subsidiary of Indiana Standard.

CANADA

New Black Plant

Cabot lets contract for big oil-furnace unit at Sarnia

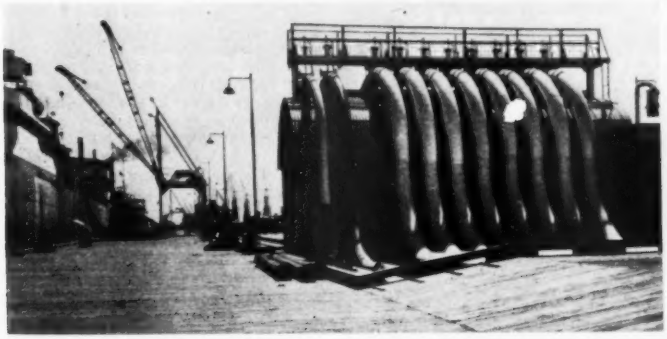
SARNIA, Ont.—Construction has begun here by Cabot Carbon of Canada, Ltd., on a new 20,000,000-lb. oil-furnace carbon-black plant which will cost in excess of $2,000,000. Stone & Webster Canada, Ltd., has construction contract, and preparation of a 15-acre site near Polymer Corp.'s synthetic-rubber units is now in progress.

Louis W. Cabot, vice president of the Cabot company, is directing the enterprise, which will produce HAF (high-abrasion-furnace) blacks which are widely used throughout the Canadian rubber industry. Raw material for the production initially will come from refineries in the United States initially.

Provision will be made for manufacture of FEF (fast-extruding furnace) blacks and other types as needed by the industry.

The plant will include a complete smoke-elimination system, utilizing special bag filters employing new synthetic fibers resistant to high temperature. It will operate without delivering black or smoke to the atmosphere.

Design for the plant was prepared by Cabot Engineering Co., Pampa, Tex.



BIGGEST TANKER PIER.—Probably the world's busiest oil port today is the pier at Kuwait, a portion of which is shown here. The expansion bends in the eight 24-in. tanker-loading lines at right are arranged over a compressor house which provides air for crane operations. At the time this picture was taken, six tankers with an aggregate tonnage of 109,000 were berthed on the tanker-loading side of the pier.

Optimum Operation

Record demand for Kuwait oil is taxing field facilities; expansion to boost Burgan output to 900,000 bbl. daily

Dahl M. Duff

AHMADI, Kuwait.—At current levels of production, ranging up to slightly in excess of 700,000 bbl. daily, Kuwait Oil Co., Ltd., has virtually no margin left at any point from well head to tanker berth.

During the next 12 months, however, work now under way or planned will progressively expand the company's facilities, and by the middle of next year its system is expected to be able to handle up to 900,000 bbl. daily.

Even before the Iranian crisis, the development of Kuwait in 6 years to become a leading world oil producer was one of the most remarkable achievements in the industry. Since midsummer, production has been raised nearly 200,000 bbl. daily, and as a result, the facilities all along the line are stretched to the limit. The present all-out operation has taken up completely the reserve capacity which would be available under normal circumstances.

Considering the amount of oil produced, Kuwait is a fairly compact oil operation. The company town and headquarters, Ahmadi, is situated on a 400-ft. high ridge overlooking the shore of the Persian Gulf and the tanker jetty 7 miles to the east. Burgan field begins about 9 miles southwest of Ahmadi with the farthest separator station 16 miles away.

World's biggest pool.—Burgan field is considered to be the world's largest single oil reservoir, with reserves conservatively estimated at about 11 billion barrels. Kuwait Oil, owned 50-50 by Anglo-Iranian Oil Co., Ltd., and Gulf Oil Corp., obtained the concession in 1934.

The discovery was made in February 1938 in the second test drilled. In July 1942, the seven productive wells completed to that time were plugged, and work was halted for the duration of the war. Drilling was resumed the latter part of 1945, and the first commercial export of oil was made on July 1, of the following year.

The field has an areal extent of approximately 60,000 acres. Field-well drilling has now been completed to fill a 600-acre spacing pattern. The company recently started drilling infill wells for 200-acre spacing in the central part of the field, and two rigs are being used on this program. This denser spacing will require about 50 more wells above the 110 now drilled.

Average total depth of the wells is around 4,600 ft. The Burgan series consists of four zones, a first sand averaging 100 ft. thick; a second limestone zone 20-165 ft. thick and containing negligible oil; and the main reservoir in the third and fourth sands which are 200 to 300 ft. and 500 ft. plus thick respectively.

Since the crude shows only a trace of H_2S, stabilization is not required. Sulfur amounts to 2-2½ per cent. and gravity ranges between 32° and 33° in the first zone, and from about 30° to 32½° in the third and fourth zones.

The field has an active water drive and a gas-oil ratio of 500. Pressure measurements, which in Burgan are carried to exacting tolerances, are reported to have shown only a relatively small decline in reservoir pressure to date.

Burgan wells are produced through both casing and tubing. Per-well production ranges from 1,500 to 10,000 bbl. daily or more. The over-all average is about 6,400 bbl. daily.

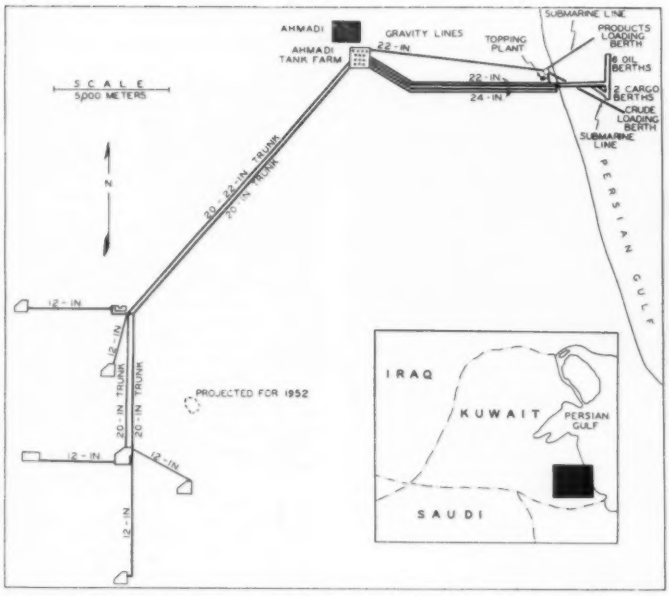
Field facilities.—The field is now served by six separator stations, each of which was built to serve a group of 20 wells connected by 6-in. flow lines averaging 2 miles in length.

Separators are of the type developed by Anglo-Iranian in Iran, employing horizontally inclined vessels, two in parallel for the first 425 psi. stage, one each for the 200, 100, 50, and 25-psi. stages, and two in parallel for the 10-psi. stage.

These stations, costing the equivalent of about $1,500,000 each, also include pump house and 120 000 bbl. of tankage—two 50,000 bbl. main tanks and two 10,000-bbl. tanks for use for the test separators. Lines of 12-in. diameter tie the separator stations into the two 20-in. trunk gathering lines which extend from the Ahmadi tank farm to the center of the field.

The tank farm at Ahmadi serves both for royalty gaging and as working storage. There are 21 tanks with a total capacity of approximately 3,000,000 bbl. Two of the tanks are now in fresh-water service.

FIELD SEPARATOR.—Shown here is one side of a separator battery and building in Burgan field, the world's largest single oil reservoir.



***ACTIVE AREA.**—This scaled sketch shows Kuwait's oil-handling facilities. Polygons at the ends of gathering lines are separator stations in Burgan field, each of which processes the output of 20 wells, or an average of about 128,000 bbl. of crude per day. Lines extending from Ahmadi tank farm are gravity loading lines which carry the crude to the topping plant near the water's edge and to the tanker-loading pier.*

From Ahmadi the crude is flowed by gravity down the even slope to the jetty. Five gravity lines are provided, two of 22-in. diameter and three 24-in. These gravity lines are so manifolded that they can discharge into any one of the eight 24-in. tanker-loading lines.

In addition, one crude-oil tank and pumps are provided near the jetty. Thus it is possible to service six of the loading lines simultaneously—five from the gravity lines and one from the tank using the pumps.

Largest oil pier.—The jetty at Mina-al-Ahmadi (Port of Ahmadi) is the largest of its kind in the industry.

It is T-shaped, the approach being 4,100 ft. long. The main section, 3,880 ft. long, has berths for six tankers and two cargo vessels. There is 45 ft. of water, and the jetty can take at one time four supertankers along with two of smaller size. In addition, one offshore submarine line is available for crude loading, and a second for products exports and imports.

The Kuwait refinery, located near the entrance to the approach section of the jetty, is a simple topping plant of 25,000 bbl. daily capacity primarily providing ships' bunkers of both diesel and heavy fuel oil, together with all requirements of Kuwait State. The refinery was built by E. B. Badger, and the jetty by International Bechtel, Inc. Both were commissioned in 1949.

Need for expansion.—By the latter part of 1950, when most of the development work had been completed, these facilities provided a balanced system designed to meet normal average requirements of 500,000 bbl. daily.

The jetty's capacity was adequate to offset periods of bad weather or tanker delays. On the other end, there was sufficient capacity in the field to take care of sudden, heavy withdrawals at the dock.

During the first half of this year, production averaged 444,000 bbl. daily and ranged from a low of 359,000 bbl. daily in February to 525,600 bbl. daily in June. Since the latter part of June, when exports were halted from Iran, the demand for Kuwait's oil has been all that it could supply.

Six separator stations give a connected-well and degassing capacity on the order of 720,000 bbl. daily maximum. A seventh separator station was scheduled to go on stream in October, raising capacity of these facilities to above 800,000 bbl. daily. Ground was broken recently for an eighth station, and when it is completed and the connections made by the middle of next year, separator capacity will be on the order of 900,000 bbl. daily.

Pump capacity to the Ahmadi tank farm is now approximately 720 000 bbl. daily. A third 20-in. main gathering line is planned for completion by the end of the first quarter of next year. The new line will increase capacity of this part of the system to nearly 1,000,000 bbl. daily.

With a peak level of operation such as is occurring at present, additional tankage at Ahmadi is a primary need. Of the storage now available at Ahmadi, only about 1,400,000 bbl. is normally available to meet fluctuations in the system. Construction scheduled to take place over the next year and a half will add seven 168,000-bbl. tanks, and the two now in water service are to be returned to crude-oil service.

At the present time, the company is completing the installation of automatic control equipment at the tank farm. This consists of automatic liquid-level and remote-reading gages and automatic electric gate valves on the delivery, filling, and loading lines. The work is due for completion by the first of the year, and the result will allow quicker control of the tank farm from a central dispatch building in Ahmadi.

Loading problem. — Another recognized need is for a considerably greater tanker-loading capacity than the anticipated day-in, day-out average.

Good conditions, meaning an almost constant line of ships waiting to come in and load, allowed 181 tankers to be served from the Kuwait jetty in July and 182 in August. The highest number prior to July, when the heavy Iranian-replacement demand began, was 132 in April. In September, however, interrupted tanker arrivals brought total tanker loadings down to 164.

The drop in tanker loadings was, of course, reflected in production, which was cut to 625,000 bbl. daily. In August, production averaged 686,700 bbl. daily, and in July 646,000 bbl. daily.

About 75,000 bbl. an hour can be loaded into tankers at the jetty at present, but the total number of tankers served during any one month depends on several factors, including size of the ships, weather, and speed of turnaround.

Normal time at the jetty for a ship is about 20 hours, but roughly half of this is required for operations other than loading, such as discharging ballast, moving in and out, and connecting. The best Mina-al-Ahmadi has ever done in a single 24-hour period was to load approximately 1,000,000 bbl. This was under the most optimum conditions.

Pier conversion. — Plans are now being made for the conversion of the two cargo berths to tanker service. This will probably be completed next summer and will necessitate unloading company cargo when possible from any idle berth.

Another project now in the planning stage is the addition of a seventh tanker berth to the six now available. This new tanker berth would be placed in one of the two blank berth-

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ing spaces on the shore side of the jetty. The plans also call for laying of a sixth gravity flow line of 30-in. diameter from the Ahmadi tank farm.

By the middle of next summer when the new berths, field and gravity lines, and separator stations are in operation, capacity of the entire system will be 900,000 bbl. daily and possibly even higher. At present, even under favorable conditions of tanker availability and with loadings geared to producing and oil-handling capacities, 700,000 to 720,000 is the maximum.

Besides the priority job of eliminating system bottlenecks and expanding capacity, Kuwait Oil is carrying on an exploratory program which is at present centered in its Magwa 1 wildcat. This well was spudded in August at a location about 7 miles north of the north end of Burgan field on a separate seismograph and structure drill prospect. This is the first exploratory well drilled outside Burgan since the original field discovery itself.

The exploration effort prior to this well was directed to the drilling of DT12, the company's deep test in the center of Burgan field. DT-2 went to 13,853 ft. before it was completed as a producer in the regular Burgan sands several months ago. Testing of the deeper horizons was negative. The well had the top of the Jurassic at 6,988 ft., and may have entered the Triassic near its total depth.

Independent Exploration, Ltd., (Independent Exploration Co.) is providing a seismograh crew and equipment under contract to Kuwait Oil Co. This party will be used to follow up preliminary reconnaissance work in, among other areas, the north-central part of the shaikhdom.

Water problem. — The problem of fresh water in Kuwait is being met by the construction of distillation plants. The company has a distillation plant producing 500,000 gal. daily of distilled water from seawater. This output is supplemented by brackish water drawn from five wells 20 miles west of Ahmadi at Minagish.

Kuwait is entirely without sweet water and for centuries has depended on imports of Arab dhows from the Shatt-el-Arab in Iraq. The Kuwait Government has a 1,000,000-gal. daily distillation plant under construction to serve its own people. This plant, financed from oil revenue, is to be completed in 1953. The ruling shaikh of Kuwait also has been negotiating with the Government of Iraq in regard to the construction of a water pipe line which would extend from the mouth of the Shatt-el-Arab into Kuwait.

U. S. Loan to Iran?

State Department reveals no progress made in talks with Premier Mossadegh, "sympathetically considers" big loan

Dahl M. Duff

CONSIDERABLE opposition appears to be building up against the granting of the United States loan to Iran requested by Prime Minister Mossadegh after his rejection of various American proposals for the settlement of the oil-nationalization issue.

Reports from Washington that the State Department is giving "sympathetic consideration" to the Mossadegh appeal for financial assistance had a distinctly unfavorable reaction in Britain. The British feel that any agreement with the present Iranian Government is impossible.

Iran's decision to ask for financial help from the United States was disclosed by Mossadegh November 14 during his speech in Washington before the National Press Club. During his talk, he said Iran was requesting the loan to prevent paralysis of its economy. The $120,000,000 figure was given by other officials as the amount being sought.

No progress.—Earlier, the State Department in a formal release confirmed reports that its discussions with the Iranian leader had failed to find any new basis on which a settlement of the oil issue could be reached.

The department said the United States continues to hope a mutually satisfactory basis for an agreement will be found and that this country would do everything possible to assist toward this end. Neither the department in its brief statement nor Mossadegh in his speech gave any details of the proposals advanced during the recent discussions in Washington.

Mossadegh's discussion before the Washington journalists offered little new. Mostly it was devoted to a review of already well-known charges which have been made by Iran against Anglo-Iranian Oil Co., Ltd.

Mossadegh spoke in Persian and his remarks were later translated. Several questions were asked, but before answering, Mossadegh each time went into a huddle with his advisers. On only one did he give an immediate reply, and this was a definite denial that Iran has been negotiating with any United States oil companies on operation of its nationalized industry.

Most of the ills besetting Iran were blamed on activities of Anglo-Iranian, its agents, and secret organizations affiliated with it. He said Iran had suffered greatly as a result of World War II in which it had been of great importance to the Allied cause. During the occupation, he said, corrupt elements in the country, which had come to power through foreign pressure and which were the political tools of Anglo-Iranian, took advantage of the presence of foreign forces to increase their power.

"The Iranian people, having lost much of their vitality during the course of 50 years of cruel imperialistic exploitation and being cognizant of the fact that their independence or rather their very existence had become a plaything in the hands of the oppressive policies of some foreign governments, decided once and for all to overthrow the influence which was exercised by the former Anglo-Iranian Oil Co., and to become the masters of their own destiny," he said.

The prime minister pointed out that the Abadan refinery had resumed operations and declared Iranian technicians could run the plant at 30 per cent of capacity (this would be equivalent to about 150,000 bbl. daily). He said Iran was planning to employ the necessary foreign technicians and to educate its own young men in various branches of the industry.

Oil revenues will be the security for the loan which is being asked from the United States, Mossadegh said. In asking the loan he said he had in mind the "former promises of higher American authorities for extending their economic aid to Iran."

Loan frowned on.—Officials in London held to the view that an American loan to Iran would only serve to postpone the formation of a new Teheran government which probably would be more inclined to negotiate on reasonable terms. They said it would be particularly desirable to withhold any consideration of the loan until after Britain's Prime Minister Churchill confers with President Truman in Washington in January. It is anticipated that some coordination of United States and British policy on the Middle East will result from this meeting.

In this country, the proposed Iranian loan was called a "reward to Iran" for its violation of a contract and expropriation of the British-built oil industry. It was felt such a step would further weaken all types of foreign investment (including oil) by giving what amounts to encouragement for nationalization. The view was that Mossadegh was definitely playing on State Department anxiety to keep Russia out of the hands of the Communists, a development from which Mossadegh and his supporters would suffer as much as anyone else.

The Iranian prime minister was reported to have asked a total of $120,000,000, in payments of $10,000,000 a month. This sum was regarded as too high by Washington officials, but they were studying the possibility of grant-

ing some lesser amount. The London Times said that "the continuance of Prime Minister Mossadegh in office, having regard to the social and economic effects of his policy, might be more dangerous than his fall." In this country, the New York Times commented that the "now-commonplace threat of 'chcose between us and the Communists' is a species of blackmail."

Difficulties at home.—Mossadegh, who has been in the United States since October 8, faced increasing opposition and economic difficulties on his return to Iran this week. Elections to the Iranian Parliament, which were scheduled for November 21, were postponed to December 18 because of the delay in the premier's return, and this gave further encouragement to the parliamentary opposition, which believes that another month would make the chances of ousting the Mossadegh group even brighter.

The International Monetary Fund advanced Iran an $8,700,000 credit last week to help tide it over the financial crisis. This dollar credit is against the payment of Iranian rials and is in a somewhat different category than a straight-out economic loan such as the United States Government is now considering.

Although there were open charges in the Iranian Parliament last week that Mossadegh had "bungled" the handling of the oil nationalization, the opposition in Teheran was reported as believing that his position on the oil question was unassailable, but that he could be defeated on the economic and financial crisis that is taking shape as a result of the loss of payments formerly made by Anglo-Iranian.

Anglo-Iranian reported last week in London that the last of its personnel in Iran had been withdrawn. Even after the final evacuation of staff from Abadan, N. R. Seddon, the company's chief representative in Teheran, and R. H. Stirling, his personal assistant, remained in the Iranian capital. These two contact officials with the government have now left Iran.

Refining buildup.—The buildup of foreign refinery capacity, which has been sharply accelerated in the last 6 months since the Iranian shutdown, was reflected in another announcement by Anglo-Iranian that its Llandary refinery in South Wales has raised throughput by 25 per cent in the last few months and now is capable of processing 4,000,000 tons (about 80,000 bbl. daily). Anglo-Iranian also said it is on schedule with the construction of its 80,000-bbl. daily Kent refinery.

As would be expected, Anglo-Iranian has been in the forefront of recent moves to build up foreign-refining capacity. However, a number of other companies have announced projects since last spring. There are now four large-size refineries slated for Australia which are expected to give that country a total capacity of 200,000 bbl. daily or more. A projected South African refinery is being enlarged, and plans are active for construction of one or more refineries in India.

Throughout Europe, capacity of many existing plants is being increased. All this work is in conformity with the general policy of locating refineries in consuming countries instead of at the source of crude oil as was the case with Abadan.

Kuwait Settlement

K.O.C., sheik reported to have agreed on 50-50 split

KUWAIT OIL CO, LTD., and the ruling sheik of Kuwait are reported to have finally settled on the terms of the new 50-50 participation agreement which has been under study for several months.

In London, officials of K.O.C. said that an announcement on the agreement probably would be made in about 2 weeks. C. A. P. Southwell, the company's managing director, arrived in Kuwait early in October, and the subsequent discussions on the agreement have been reported making "very satisfactory progress."

It long has been known that government payments in Kuwait would be substantially increased. Reports in the industry are that the new agreement in general will be similar to that already reached by Iraq Petroleum Co., Ltd., with the Government of Iraq and now awaiting parliamentary approval.

Kuwait's present royalty is figured on a rupee basis and amounts to slightly more than 9 cents a barrel. Presumably a new agreement will be retroactive as has been the case with other Middle East royalty settlements.

Stoppage insurance.—The Baghdad report said that one feature of the agreement provided for the payment to Kuwait of £5,000,000 annually if for any reason production was halted. This was not confirmed by the company in London which said it was not prepared to discuss details prior to the main announcement.

K.O.C. is owned equally by Anglo-Iranian Oil Co., Ltd., and Gulf Oil Corp. The sheikdom is located at the head of the Persian Gulf, covers 6,000 sq. miles, and has a population of about 150,000 persons. Since the Iranian shutdown, it has moved up to the position of the world's fifth largest producing country with a daily output ranging up to about 700,000 bbl. daily. Kuwait is one of the several Persian Gulf sheikdoms which is under protection of the British Government through treaty arrangements. In addition to the K.O.C. concession, Kuwait has an undivided half interest in the neutral zone to the south and has given rights in this area to American Independent Oil Co. The present ruler, His Highness Sheik Abdulla Al Salim Al Subah, acceded to the rulership after the death of his cousin in January 1950.

Creole Operations

Creole Petroleum Corp.'s operations report for September showed a production of 725,204 bbl. daily, an average of 15.6 rigs running, and the processing of 65,267 bbl. daily and 56,748 bbl. daily at the Caripito and Amuay refineries.

The daily average operated production included 579,084 bbl. daily in the Lake Maracaibo area, 3,383 bbl. daily in Cumarebo and Mara, and 142,737 bbl. daily in Eastern Venezuela. During the month, the company's net production plus purchased royalty oil averaged 765,917 bbl. daily.

The company drilled six exploration wells during the month, resulting in three oil producers and three dry holes. The successful wells were in Cumarebo, total depth 3,901 ft. and 349 bbl. daily initial production, Maracaibo, average initial production, 1,320 bbl. daily; and in Quiriquire, total depth 5,334 ft., initial production not available.

International Briefs

Soc. Generale des Huiles de Petrole (S.G.H.P.) has started construction of a petrochemical plant in southern France close to its L'Avera refinery. Necessary feed stocks for the plant will be supplied by the refinery. The petrochemical plant will be owned by Naphtachimie in which S.G.H.P. is a partner with Pechiney and Kuhmann. S.G.H.P. is an affiliate of Anglo-Iranian Oil Co., Ltd.

Petroleos Mexicanos has announced plans for the construction of a new refinery at Macuspana, Tabasco, to process newly developed crude production in the region. According to reports from Mexico City, the plant will cost about Ps. 50,000,000, and will be tied into the trans-Isthmus pipe line from Minatitlan to Salina Cruz.

Glenn McCarthy, Houston independent operator, arrived last week in Cairo, where Egyptian sources said he was considering possible oil operations in that country. While McCarthy had little to say about his trip, Cairo reports were that the Egyptian Government was seeking to interest him in taking over the Wadi Feiran concession area which Standard Oil Co. of Egypt abandoned 3 years ago in the face of legal difficulties of operating in Egypt.

PERSONALS

Veteran Contractor

Parker Drilling Co. head has operated for 20 years

GIFFORD C. PARKER, president of Parker Drilling Co., Tulsa, after two decades of contracting experience ranks as one of the nation's leading drilling contractors.

Owner of 54 rotary rigs operating throughout the United States and Canada, his rotaries are represented in many of the important field developments in the Western Hemisphere. Currently, he is running 5 rigs in the Spraberry trend in West Texas where he has already completed 22 wells for various oil companies.

Parker was born in 1897 in Robinson, Ill., and attended schools in that city. At the age of 15 he went to work as a lease pumper at Flat Rock, Ill. In 1919 he moved to Oklahoma where he obtained experience on cable-tool rigs.

His career as a drilling contractor commenced in 1929 when he entered Oklahoma City field. The following year he became a partner of the firm of Campbell & Parker Drilling Co. He incorporated the present firm of Parker Drilling Co. in 1935, starting with two used rotary rigs.

In the early 30's he was active in the development of East Texas oil field. In more recent years his rigs were used in drilling up the big Slaughter and Seminole fields in West Texas. Parker rigs have been used on the discovery well at Pincher Creek, Canada; for Gulf Oil Corp.; and at Bude, Miss., for Barnsdall Oil Co.

Robert L. Foree, of Dallas, will become director of production of the Petroleum Administration for Defense on January 1. He replaces **Richard G. Lawton,** Arkansas independent, who has served as PAD production director since the post was created soon after the Korean outbreak. To accept the appointment, Foree will resign as president of Texas Independent Producers and Royalty Owners Association.

Dr. John F. Foster, supervisor of fuels research at the Battelle Memorial Institute, Columbus, Ohio, has been elected chairman of the American Chemical Society's division of gas and fuel chemistry for 1952. He succeeds **Dr. Arthur A. Orning** of the Carnegie Institute of Technology. **George D. Creelman,** research director of the M. A. Hanna Co., Cleveland, was chosen chairman-elect, and **Dr. Harlan W. Nelson,** also a supervisor of fuels research at the Battelle Institute was named secretary-treasurer.

David Graham, of Tacoma, Wash., has been elected financial vice president of Standard Oil Co. (Ind.), filling the vacancy created by the death of R. J. Lindquist.

Jack H. Rankin, assistant division superintendent at Independence, Kans., for Sinclair Oil & Gas Co., will be transferred to Oklahoma City effective December 1. **Charles F. Terrell,** division engineer at Tulsa, will be transferred to Independence effective the same date.

S. T. McCardell, general drilling and production superintendent in The Texas Co.'s Louisiana division, has been promoted to assistant division manager. **J. L. Shea, Jr.,** superintendent of the Houma, La., district, has been advanced to McCardell's position; and **J. H. Gibbens,** assistant district superintendent at Harvey field, Louisiana, will move up to district superintendent at Houma. Replacing Gibbens at Harvey field will be **J. J. O'Brien,** assistant to the general superintendent of drilling and production in the New Orleans division office.

Graham S. Campbell, Phillips Petroleum Co., has been elected president of the Intermountain Association of Petroleum Geologists. Other officers elected were: **Irwin W. Clark,** Standard Oil Co. of California, vice president; **J. R. Boshard,** Sun Oil Co., treasurer; and **Frank J. Adler,** Phillips, secretary.

Joe A. Champion, geologist for Shell Oil Co., is now located in Corpus Christi, Tex. He was formerly with Standard Oil Co. of Venezuela (now Creole Petroleum Corp.) and joined Shell in Houston in 1946.

Burton D. Salmon, vice president of Salmon Oil Corp., has opened new offices in Tulsa. He will manage the company's operations in the Mid-Continent area with **G. P. Alden. Walter J. Salmon,** of New York City, is president of the firm.

Frank O. Prior, executive vice president of Standard Oil Co. (Ind.), Chicago, has resigned as president

FRANK O. PRIOR

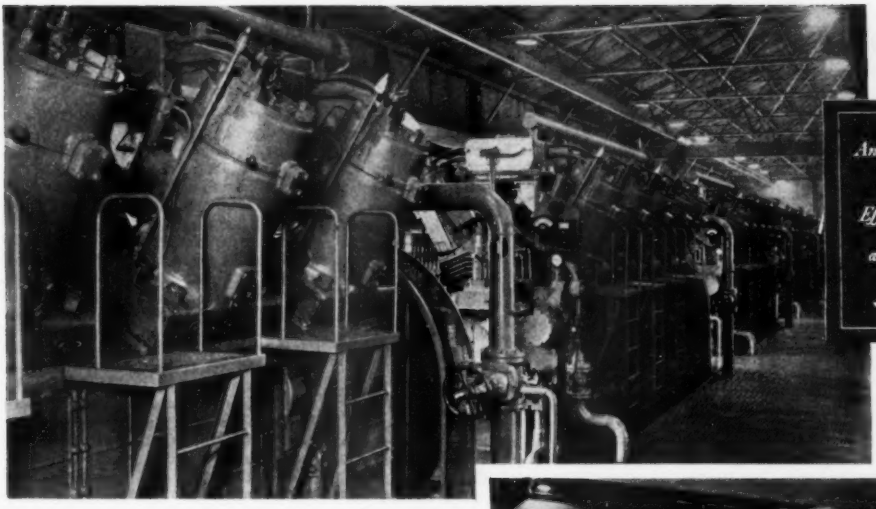
R. E. NELSON

of Wyco Pipe Line Co. **R. E. Nelson, Jr.,** general manager of crude-oil supply and products pipe lines for Standard and vice president of Wyco, has been elected president of Wyco succeeding Prior. **D. L. Rankin,** manager of the products pipe-line department of Standard, has resigned and become manager of Wyco at Denver. **Sam L. Jackson,** assistant manager of Standard's products pipe-line department, succeeds Rankin as department manager. **W. A. Bennett,** general superintendent of Wyco, has been named vice president of Wyco succeeding Nelson, and has also been appointed assistant manager of Standard's products pipe-line department, succeeding Jackson. Wyco is owned by Indiana Standard, The Texas Co., and Socony-Vacuum Oil Co., Inc., and operates a common-carrier products line between Casper, Wyo., and Cheyenne, Wyo., and Denver.

Leonard W. Bughman, John J. Dowdle, III, Bartley J. Fleming, and **Willis P. Tuller** have been elected vice presidents of Great Lakes Carbon Corp., New York City.

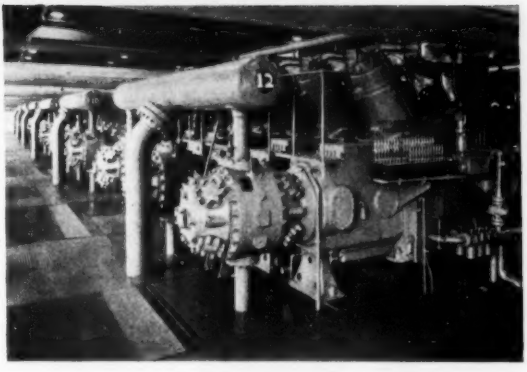
Neale Boyd has been elected treasurer of Anderson-Prichard Oil Corp., Oklahoma City, succeeding **T. H. Marshall** who has retired. **S. A. Garrison** has been elected to the newly created position of controller. **Roy Winters** was elected assistant controller.

J. V. Wicklund, Detroit producer, has been elected president of the Oil and Gas Association of Michigan for 1951-52. He succeeds **I. W. Hartman,** Mount Pleasant, Mich., independent producer. **T. G. Caley,** Basin Oil Co., Saginaw, Mich., was elected vice president, **Kurt deCousser,** Socony-Vacuum Oil Co., Inc., and **O. H. Kristofferson** will continue as treasurers, and



Another Example of Efficient Power at Lower Cost

Shown here from the crankdoor side are 7 of the 14 GMV's at Bald Knob, Arkansas. Shown opposite is the other 7-unit line-up from the compressor cylinder side. Each is a 10-cylinder, 1,100 hp GMV.



GMV'S ON THE LINE

. . . proof of the pudding at Bald Knob

Bald Knob station has now been in operation over 2 years and is the most powerful reciprocating compressor station on the Texas Eastern system. Here, in as clean cut a station as you'll ever see, 14 Cooper-Bessemer 1,100 hp GMV's . . . modern V-angles provide low-cost, trouble-free performance month after month.

More and more Cooper-Bessemer V-angles have been added to the Texas Eastern system with each expansion. Today, GMV's on these lines total 61,900 horsepower. Soon, another 16,900 V-angle horsepower will be added — Cooper-Bessemer GMW's and GMV's — for the new Lambertville, N. J. and Kosciusco, Miss. stations.

If your plans call for compressor horsepower, get all the facts on V-angles — the modern GMW's, GMV's and GMX's, from 220 to 3,000 bhp.

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Odessa, Texas Seattle, Wash. Tulsa, Okla. Shreveport, La.
St. Louis, Mo. Los Angeles, Calif. Chicago, Illinois Caracas, Venezuela

PERSONALS

William Palmer was renamed secretary. **Crawford Daily,** of Daily Crude Oil Co., was elected to the board of directors for a 4-year term.

John J. Whelan, formerly a regional engineering supervisor at Esso Standard Oil Co.'s Bayway, N. J., refinery, has been promoted to supervisor of all mechanical crafts. He is succeeded by **Alfred W. Sitarski,** former assistant. **Ray A. Elmendorf** has been named group head in charge of inspection work in the chemical-products areas of the refinery.

Thomas D. Cabot has been elected vice chairman of the board of directors and executive vice president of Godfrey L. Cabot, Inc., at Boston. Cabot withdrew from the Cabot companies in the early part of the year to assume the duties of director for International Security Affairs in the office of the United States Department of State.

W. C. McGee, Jr., general superintendent for Tennessee Gas Transmission Co., has been named vice president and general superintendent of the firm. **Joe J. King,** formerly chief engineer, was elevated to vice president in charge of engineering, and **Carl Myers,** formerly treasurer, was made vice president in charge of the firm's Commerce Building and of company insurance. **Cecil C. Johnson,** formerly assistant controller, was elected treasurer; and **Edward S. Murray** has been promoted from assistant chief engineer to chief engineer. **E. E. Miller,** in addition to his duties as vice president of the Northeastern Gas Transmission Co., will also serve as assistant chief engineer of Tennessee. **Earl McNeill** was elected vice president of Tennessee Production Co., another subsidiary engaged in oil and gas exploration and production in the Southwest. He formerly was general superintendent.

W. C. McGEE, JR.

JOE J. KING

W. J. Edmund has been named chief petroleum engineer for **E. L. Doheny,** operator at Beverly Hills, Calif. For the past 6½ years Edmund was with Standard Oil Co. of California as a development engineer in the San Joaquin Valley area.

Harry S. Brigham, superintendent for Western Gulf Oil Co. at Bakersfield, Calif., left recently for Maracaibo, Venezuela, on a special assignment with Mene Grande Oil Co.

C. L. Mayhall, widely known in refinery circles of the Mid-Continent and Middle West areas, will retire as vice president in charge of refined-oil sales of Anderson - Prichard Oil Corp., Oklahoma City, effective December 3. He entered the oil business in 1917 with an Oklahoma subsidiary of Ohio Cities Gas Co. (later Pure Oil Co.). In 1920 he became sales manager of Imperial Refining Co., and assumed the added sales duties of Kettle Creek Refining Co. in 1922. He was placed in charge of sales for Anderson-Prichard and had a prominent part in the expansion of that organization. "Carl," as he is generally known by his friends, says he expects to travel and "improve my golf and fishing" after retirement. He is active in the affairs of the Western Petroleum Refiners Association and is a member of the Twenty-five Year Club of the Petroleum Industry.

Early N. Spiars, owner and operator of Spiars Equipment Co. of Midland, Tex., has been elected president of the Permian basin chapter of the American Petroleum Institute. **John Ed Cooper,** senior vice president and general sales manager of Western Co., was elected first vice president; and **M. R. Hayes,** division superintendent for Phillips Petroleum Co., was named second vice president of the A.P.I. chapter. **Joe Fair,** superintendent for Stanolind Oil & Gas Co., was elected third vice president.

Albert V. Lockett, civil engineer in the East Texas division of Humble Oil & Refining Co., has been transferred to the Means district in the West Texas division and promoted to district civil engineer. Other changes in Texas include: **Leon B. Parker,** civil engineer in the Gulf Coast division, transferred to the Tomoconnor construction district and promoted to district civil engineer; **D. J. Lewis,** district civil engineer at Anahuac, Tex., transferred to the Gulf Coast division as supervising engineer; **J. H. Pittman,** district civil engineer for the Houston construction district, transferred to Ahahuac as civil engineer; and **S. J. Lewis,** senior civil engineer in the Gulf Coast division, transferred to East Texas as assistant division civil engineer.

George H. Galloway, Central division geologist for Stanolind Oil & Gas Co. at Oklahoma City, has been transferred to Tulsa as assistant chief geologist, programs. **E. W. Price** succeeds Galloway at Oklahoma City as division geologist, and **E. L. Selk** replaces Price at Oklahoma City as district geologist for the Oklahoma district. **William S. McCabe** assumes a new title, regional geologist for the Rocky Mountain division and Canada. **John C. Johnston** succeeds McCabe as division exploration superintendent, and **Ross W. Craig** becomes division geologist replacing Johnston. All three will be located in Casper, Wyo. In the North Texas-New Mexico division at Fort Worth, **Russell Farmer** has been promoted to division consulting geologist, and **Thomas A. Hendricks** to division geologist.

J. ED WARREN

J. Ed Warren, independent oil operator of Midland, Tex., and recently retired president of the Independent Petroleum Association of America, will succeed **Bruce K. Brown** as deputy administrator of the Petroleum Administration for Defense next June 1. Brown left the presidency of Pan-Am Southern Corp. a year ago to take the job. Warren is a partner in the firm of King, Warren & Dye, independent oil producers, and is president of Carl B. King Drilling Co. He was formerly president of the American Association of Oilwell Drilling Contractors, and has just completed 2 years of service to the industry as president of the Independent Petroleum Association of America.

Paul Hinyard, district geologist for Shell Oil Co. at San Antonio, Tex., has been transferred to Corpus Christi, Tex., in a similar capacity. He has been with the firm 21 years and is a former president of the South Texas Geological Society.

R. D. Council, tank farm gager for Shell Pipe Line Corp., at Houston, has been transferred to Courtableau, La., as station engineer. Other changes include: **L. P. Blackburn,** engineering assistant at Colorado City, Tex., transferred to Houston as engineer; **H. R. Good,** tank-farm gager, from McCamey, Tex., to Wasson, Tex., as field gager; **F. L. Rhamy,** station engineer, from Big Lake to Menard, Tex.; **G. C. Roberts,** station engineer at Roberts, Tex., promoted to assistant gager; and **W. H. Taylor,** tank farm gager, transferred from Houston to Big Lake as station engineer.

PERSONALS

William T. Payne, president of Big Chief Drilling Co., Oklahoma City, was elected president of the Mid-Continent Oil and Gas Association at the annual meeting of the board of directors this week in Tulsa. **R. B. Anderson,** of the T. W. Waggoner Estate, was elected first vice president, and **Clarel Mapes** was reelected secretary-treasurer. State vice presidents elected are **T. H. Marshall,** Oklahoma City; **W. G. Tierney,** Derby Oil Co., Wichita; **R. F. Windfohr,** Nash, Windfohr & Brown, Fort Worth; **A. H. Weyland,** Arkansas Louisiana Gas Co., Shreveport; **C. H. Murphy, Jr.,** Murphy Corp., El Dorado, Ark.; **E. B. McGehee,** Jackson, Miss.; **James L. Duffy,** James L. Duffy Co., Grove Hill, Ala.; and **F. A. Calvert, Jr.,** Calvert Drilling, Inc., Olney, Ill. Payne succeeds **Jake L. Hamon,** Cox & Hamon, Dallas, as president.

Sam Marie, district geologist; **Ed Brown,** geologist; **Collie Falk,** district landman; and **Woody Crawford,** scout, with American Republics Corp., will be transferred from San Antonio to Corpus Christi, Tex., on February 1, 1952, as a result of the firm's office transfer.

Dr. Ernst F. Voss and **Dr. George S. Bays,** of Humble Oil & Refining Co., were recently awarded certificates of appreciation for patriotic civilian service during World War II. The certificates, presented by **Lt. Gen. LeRoy Lutes,** commanding general of the Fourth Army, are for work done on the Technical Industrial Intelligence Committee. Voss is chief engineer of the refining department at Houston, and Bays is assistant process superintendent at the Baytown, Tex., refinery.

William Hommel, geologist for Gulf Oil Corp., has been transferred from Logan, Utah, to Tulsa in the same capacity.

Glen Schimmel and **Marshall Taylor** have resigned from Kirkwood & Co., at San Antonio, Tex., and formed a drilling firm to be known as Schimmel-Taylor Co. Offices will be at San Antonio.

Frank J. Hopwood has been elected chairman of the board of directors of Shell Oil Co., and will make his headquarters in London, England. Since 1919, when he joined Shell, Hopwood has had assignments in connection with Latin American oil operations. He was manager of Shell in Venezuela prior to 1936, when he went to Colombia to organize the first unit of the Shell group in that country. Since 1946 he has been managing director of the Shell group's major operating companies. He succeeds **Sir George Legh-Jones,** who retired as chairman of the board June 30 but will continue to serve as managing director of Shell Transport & Trading Co., Ltd.

Siro Vazquez, manager of the production department of Creole Petroleum Corp., recently left Caracas, Venezuela, for New York City where he will be acting deputy coordinator for Standard Oil Co. (N. J.) during a 6-month period.

Harry F. Ferguson, former technical assistant in the process department at Esso Standard Oil Co.'s Baltimore refinery, has been promoted to foreman in chemical processing, succeeding **Albert J. Maskell,** who has retired.

Richard C. Harris has been transferred from Caracas, Venezuela, where he was resident manager of Venezuelan Atlantic Refining Co., to Regina, Saskatchewan, Canada, where early in December he will assume his new duties as coordinator of Canadian exploration for his company.

Carl E. Stacey, production superintendent for Rowan Oil Co. at Eunice, N. M., has been transferred to Midland, Tex., as district production superintendent.

Howard A. Parker, Jr., formerly of the research department of Standard of Indiana, has been appointed technical director of Pan-Am Southern Corp.'s Destrehan, La., refinery.

Wayne M. Smith has joined Bell Petroleum Co., Los Angeles, as chief geologist. For the past 15 years Smith has been manager of exploration for Wilshire Oil Co., Los Angeles.

Ole Berg, Jr., Toronto, Ont., president of British American Oil Co., Ltd., has been elected a director of the Bank of Nova Scotia.

Frank H. Newman, Jr., a partner in the consulting engineering firm of Lockwood & Andrews, Houston, has been elected president of the San Jacinto chapter of the Texas Society of Professional Engineers.

L. Schepers has been named group director of Royal Dutch-Shell Group. He succeeds **B. T. W. Van Hasselt,** who plans to resign this year.

Members of the executive committee of the Rocky Mountain Oil and Gas Association, elected last week in Denver, include: **L. L. Aitken,** Continental Oil Co., Denver; **H. H. Healy,** Ohio Oil Co., Casper; **J. R. McWilliams,** Carter Oil Co., Denver; **C. L. Pickett,** The California Co., Denver; **C. L. Larson,** Stanolind Oil & Gas Co., Casper; **Claude Peavy,** Phillips Petroleum Co., Denver; **Tom Freeman,** The Texas Co., Denver; **J. P. Moroney,** Sinclair Oil & Gas Co., Denver; **Glen Nielson,** Husky Oil Co., Cody; **H. B. Gernert,** Tri-Good Oil Co., Casper; **R. S. Shannon, Jr.,** Pioneer Oil Co., Denver; **R. D. Smith,** Union Oil Co. of California, Great Falls, Mont.; **J. E. Manning,** Mountain States Drilling Co., Denver; and **E. S. Holt,** Utah Oil Refining Co., Denver. A story on the meeting of the association may be found on page 50.

DEATHS

Williard D. Smith, 68, secretary-treasurer of Wilshire Oil Co., died November 12 in Los Angeles. With the firm for 34 years, he first was in charge of its Fellows refinery and natural-gasoline plant. In 1921 he was moved to Los Angeles as manager of operations and in 1937 he was made assistant secretary-treasurer.

William F. Blackman, 46, geologist at Midland, Tex., for Lion Oil Co., died there November 16. Prior to joining Lion, he had been connected with Barnsdall Oil Co. and Sims Oil Co.

Walter Hughes, 67, pioneer oil man, died November 11 at Long Beach, Calif. A former superintendent of Bush-Voorhis Oil Co., he was an independent operator for the past few years.

Herbert A. Hover, 82, former oil man, died at St. Petersburg, Fla., recently. Hover drilled the first producing oil well brought in by an independent operator in Montana and built the first oil refinery in that state.

E. D. Robinson, an official of Transcontinental Oil Co., died at New Wilmington, Pa., recently.

Clifford H. Peck, 68, vice president of Midwest Oil Co., died recently at Sioux Falls, S. D.

Walter E. Nelson, Sr., 52, with Standard Oil Co., died November 12 at Los Angeles.

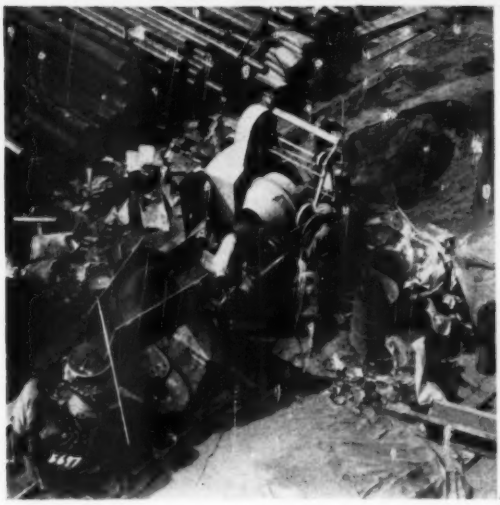


Fig. 1—Aggregates for gun-applied insulation are dry mixed in conventional concrete mixer, screened, and then fed to Gunite mixer.

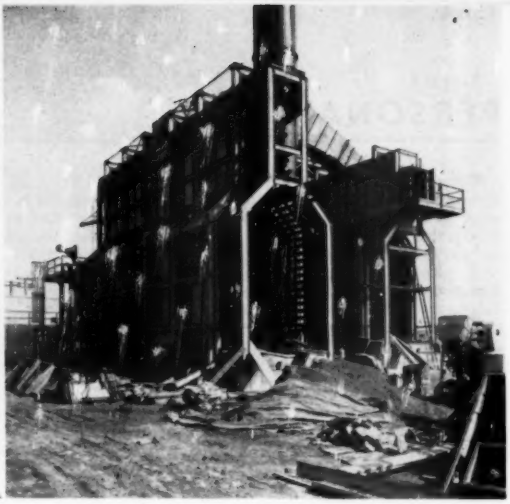


Fig. 3—Walls of this dual furnace in Aurora Gasoline Co.'s Platformer at Detroit are insulated with 3 in. of gun-applied material.

Gun-Applied Furnace Insulation

by George Weber
Refining Editor

The blown method of applying insulation mix has benefits of speed and simplicity, thus making for lower costs. So far experience is trouble free.

ENGINEERS of Aurora Gasoline Co., of Detroit, have proved to their own satisfaction, the economies of employing pneumatically applied insulation on furnace interiors. Over the past 3 years three heaters have been so insulated with satisfactory results at Aurora plants. On the basis of this experience Aurora engineers recently adapted the Gunite technique in insulating the reactor heater in a new 4,500-bbl. per day Platforming unit which went on stream in September.

The blown method of applying refractory and insulating linings is being used to an increasing extent on catalyst regenerators, stacks, and ducts. It is believed to have been used originally by Aurora in process heaters.

The first such job at Aurora's Detroit refinery was the lining of a vacuum unit heater over 3 years ago. The simplicity of the operation led to use of gun-placement insulation on the interior of a charge heater in a new fluid catalytic cracking unit. The third such job was completed 2 years ago on a visbreaker furnace.

All three of the furnaces have been inspected regularly and the insulation has performed satisfactorily. In some cases tile and brick exposed to the high interior temperatures encountered in these furnaces have required repair or replacement, but no major insulation repairs have been necessary to date.

On all Aurora jobs, insulating concrete is blown directly in place wherever possible. In cases where direct application is not possible, such as some furnace end locations, forms are poured or blown with the castable materials and the completed panels are installed after furnace tubes are in place.

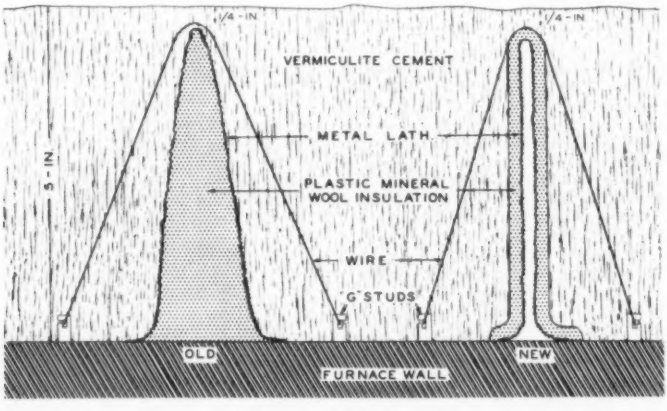


Fig. 2—Schematic arrangement of expansion joints. Method at right is used in latest applications.

Materials and Methods

Aurora uses a vermiculite insulating mix trade-named Blow-crete. It is composed of three parts by volume of Zonolite, a lightweight vermiculite aggregate weighing about 8 lb. per cu. ft.; two parts of Haydite, a medium-weight expanded clay aggregate running 60 to 80 lb. per cu. ft.; bonded with one part of Lumnite, a high-temperature cement.

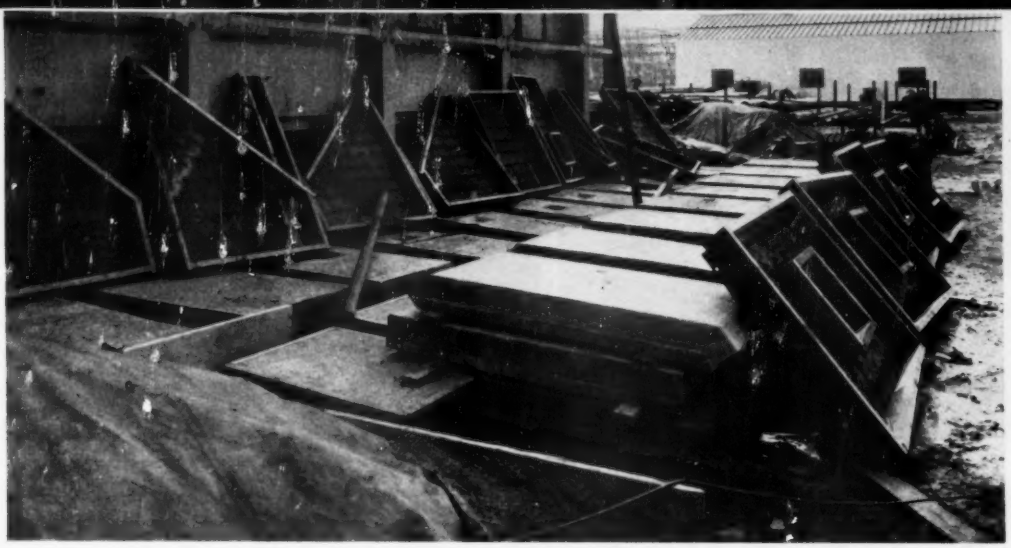


Fig. 5—Forms and cast furnace panels. Some of the forms were poured and others were blown with same mix applied to furnace walls. Two methods were used to compare service life.

As illustrated in Fig. 1, the expanded clay aggregate (top right) is shoveled into the skip of a conventional mixer. Zonolite and cement are added, together with about 1½ gal. of water per cubic foot of dry mix. The combination is mixed for approximately 2 minutes and is then dumped onto a ¼-in. mesh screen to eliminate coarse aggregate. The screened mixture is then shoveled into a V-shaped loading tray and hoed into the top of the Gunite mixer.

Studs are welded to the furnace walls at intervals of approximately 2 ft. Reinforcing mesh of corrugated nine-gage wire is then attached and insulation is blown in place before furnace tubes are installed.

On areas enclosing the radiant sections, a solid 5-in. thickness of insulation is applied. A 3-in. thickness is sufficient for insulating the areas of the convection sections.

On large blown surfaces, expansion joints are placed at intervals of about 8 ft. In earlier jobs, these joints were made of metal lath formed in a V and filled with Eagle Picher "66," a plastic mineral-wool insulating cement. In the latest application, a closed metal lath fold was fabricated for this use. Each fold was covered with EP 66 and attached to the furnace walls as shown in Fig. 2.

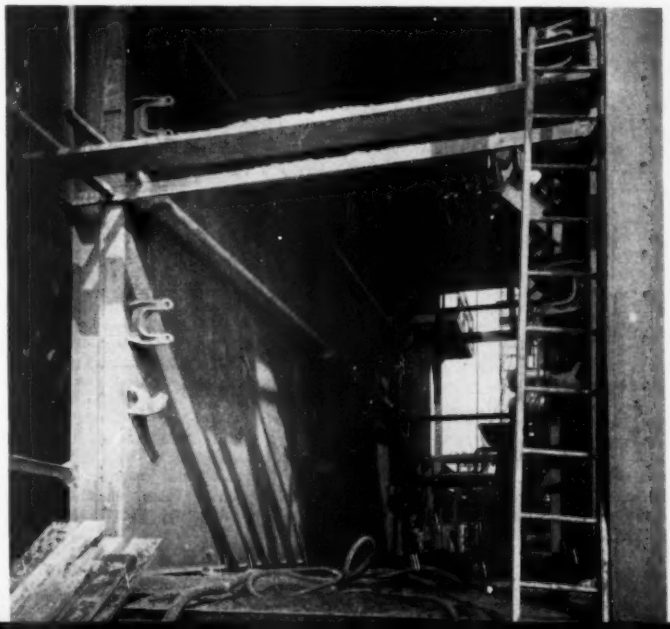
Normally, a ¼-in. layer of Blowcrete is laid over the ridge of expansion joints. This thickness of insulation has successfully protected the metal lath in all installations to date. The only instance of insulation repair was required on a small area of exposed expansion joint. Exposed to direct radiant heat, the metal lath began to break down and a simple patching job with fresh insulation mix served to protect the joint from further damage.

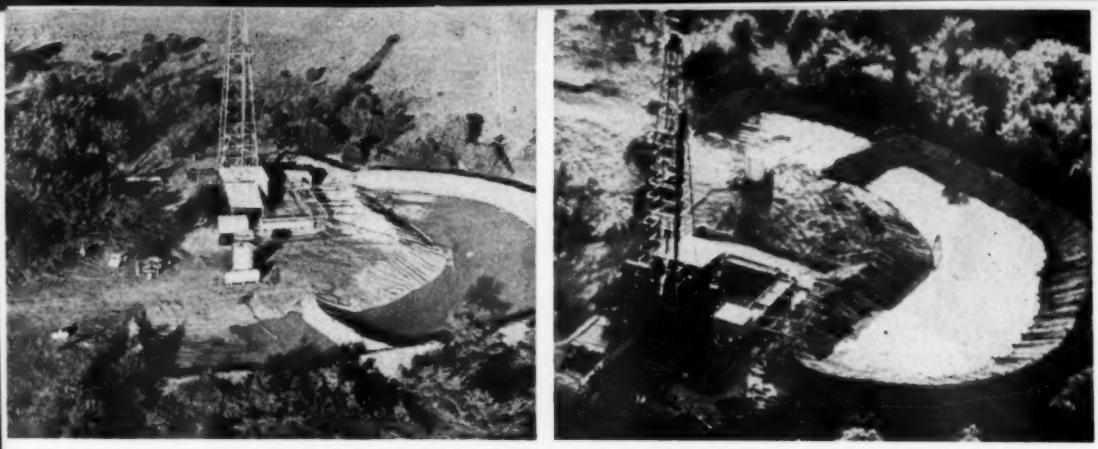
For the Platformer furnace job this summer, Aurora applied 5,964 sq. ft. of 5-in. insulating concrete and 1,190 sq. ft. of 3-in. material, by the Gunite method. The furnace (Fig. 3) is a dual unit. The charge heater (left) handles fresh naphtha feed stock and recycle gas, and the three-coil intermediate heater (right) reheats the hydrocarbon streams between the four fixed-bed reactors of the unit. Hot walls in the radiant sections will be subjected to temperatures up to 1,400° F.

As shown in Fig. 4, the long walls of the unit were lined with blown concrete before the tubes were installed. Reinforced sections (Fig. 5) were cast in forms and the finished panels were installed after the furnace coils. Some forms were poured and some were blown, using the same mix as applied directly to the furnace walls. The effect, if any, on service life and insulating properties of the insulating concrete applied by the two methods will be observed in future operations and inspections.

The trouble-free experience on the older installations of this type leads operators to anticipate a long insulation service of 10 years or more. This remains to be proven by actual experience. The principal advantages of the direct application method and the new insulating mix involved simplicity and speed, both contributing to lower costs.

Fig. 4—Side walls of heater were lined with blown concrete before installation of tubes.





Aerial view of rigs used in drilling in Sandusky fields of Grayson County, Texas.

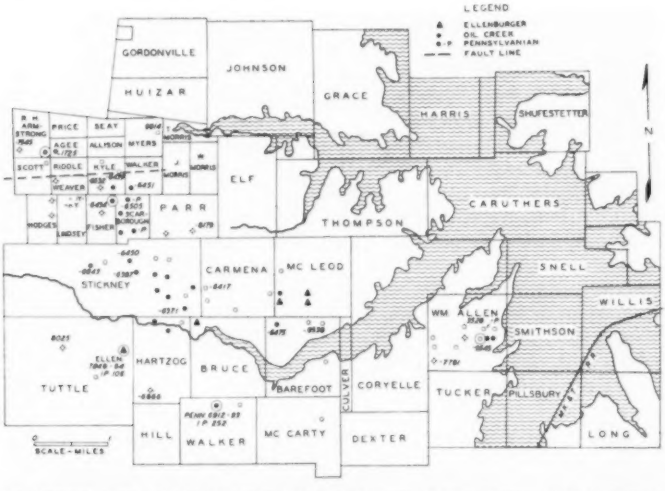
PROGRESS REPORT:

Sandusky Fields, Grayson County, North Texas

by Carl Hoot
Dallas District Editor

Development Data for Sandusky Fields

PIPE-LINE OUTLET.—Sinclair Pipe Line Co. operates a gathering system in the area which takes oil from all wells. Oil is piped to Walnut Bend field about 14 miles to the northwest where it connects with a trunk line carrier.
DRILLING TIME AND EQUIPMENT.—Rigs are evenly divided between conventional and jackknife. Drilling time, to completion, runs an average of 40 days in Sandusky-Oil Creek field, 50 days for Sandusky-Ellenburger wells, and 55 days in the deeper McMillan-Oil Creek field.
CASING PROGRAM.—Usual casing procedure is to set 1,400 ft. of 9⅝ or 10¾-in. pipe as surface casing. Oil strings are 5½ or 7-in., according to availability, which are set through the pay section and perforated.
GASOLINE PLANT.—Nearest gasoline plant is in Walnut Bend field. L. O. McMillan expects to build a gasoline plant in the Sandusky area but plans are still in the formative stage.



Development status of the Sandusky fields of Grayson County, Texas. Shaded area is Lake Texhoma at spillway level. (Base map courtesy Heydrick Map Co., Wichita Falls.)

DEVELOPMENT of the Sandusky fields of Grayson County, Texas, first in the Ellenburger, then the Oil Creek sand and now the Pennsylvanian, is rapidly proving an area which for years had been under study but which offered small chances for production, according to many observers.

Drilling has proved at least two major faults cutting oil-bearing structures. And, like other sections of North Texas, dry holes do not necessarily define areal producing limits, nor condemn much more acreage than that immediately under the derrick.

History.—The area's first deep test was drilled in 1945, in the northeast corner of the Myers Survey, southeast of Gordonville. The test was dry but had Oil Creek sand at 9,150 ft., or around 8,355 ft. subsea.

L. O. McMillan, Dallas oil man who probably had the most faith in the area's future at a time when the holes were the driest, has contributed much to its development. In May 1949 McMillan completed the second test for the area, northeast of Sandusky townsite in the Weaver Survey. This well had an Oil Creek sand section but carried water.

Locations for both of these tests were on subsurface prospects and at that time the oil-bearing structure was expected somewhat north and east of the present field outline. When the second dry hole topped the Oil Creek sand some 1,700 ft. higher than in the first duster, seismic computations were reworked on the assumption that the two wells were

(Continued on page 86)

Porosity Index in Limestone

from electrical logs

by M. P. Tixier*

PART 2

Practical Application-Limestone Curve

IN order to find the upper limit of resistivity on the limestone curve corresponding to a given size hole on the log, it is essential to be sure that the high-resistivity level used for this purpose actually belongs to a very high-resistivity formation. Many checks in wells in Scurry County, Texas, where only the pay sections were available for this study, definitely show no place where very high resistivity was present. This is, of course, a possible source of large errors; and caution is necessary.

The most resistive formations logged usually have some porosity and, therefore, a finite resistivity. Besides having very low permeabilities those formations usually are not appreciably invaded by mud filtrate.

However, it has been found in practice that a satisfactory calibration of the porosity-index scale can be obtained by assigning to the highly resistive beds in the producing zone an empirically determined porosity index. For example, in Scurry County porosity determinations in the reef limestone are found to agree satisfactorily with porosities measured on cores if the porosity of the massive reef limestone is taken at about 1 per cent.

To satisfy this need Fig. 5a, b, c, and d have been made for hole sizes corresponding to those found in Tables 1, 2, 3 and 4. These charts have been constructed in the form of triangles with multiple hypotenuses. Each hypotenuse corresponds to a given value of R_t/R_m, R_s/R_m and porosity index. The altitude of the triangle is scaled linearly with respect to R_s/R_m, and hypotenuses are drawn to fit the respective values.

The hypotenuse corresponding to $R_t/R_m = 1{,}100$ indicates a porosity index value of ±1 instead of 3 per cent as shown in the tables. This empirical correction is made, as explained above in the case of Scurry County, because porosity values in the extremely low ranges are assumed to preclude mud invasion. This, in turn, means that such a resistivity level corresponds to a lower porosity than would be calculated assuming invasion and a conductive medium of resistivity R_s. Without any doubt the accuracy in this range is poor. Furthermore, it has been found that no formation has an infinite resistivity level; consequently, this value of R_t/R_m has been taken as a practical maximum of resistivity.

In actual practice, Fig. 5a, b, c, and d are used in the following manner:

Case 1.—(Dense, highly resistant zone near porous interval under study.)

In this case, no calculation is necessary nor the knowledge of resistivity scales essential.

Measure the total "spread" between the zero line on the log and the highest point on the limestone curve. Select the triangular chart corresponding to the hole size and apply this spread on the triangle in such a way that the zero line on the log is placed on the base of the triangle and the maximum deflection of the limestone curve on the hypotenuse marked ±1 per cent porosity index on the triangle. The scale for the porosity index is given automatically (see Chart 6).

Case 2.—(No dense zone nearby, as in case of pipe set on pay.)

In this case the knowledge of the scales, as well as the resistivity of the mud, is essential because departure curves must be applied.

Using Fig. 1, it is easy to convert the values of R_s/R_m into R_t/R_m. The porosity index can then be given from Fig. 2. Such calculation can be done with both the limestone curve and the 10-in. normal. Obviously, the value of R_t/R_m as determined by the small normal and limestone curve, should be the same except for the fact that the thickness of the formation does not affect these curves in quite the same way.

When the porosity index at one given depth has been determined, one can use the triangular method mentioned above to get the scale at all resistivity levels. This time the level of resistivity for which the porosity index has been calculated must touch the hypotenuse of the triangle bearing this porosity index. It should be noted that the triangular charts included have been constructed for the limestone curve. Similar charts can be constructed for use with the short normal if desired.

After the porosity index is determined, it should be converted into porosity by use of Relations 8 and 9, or by other empirical means.

Field Example

In the example given in Fig. 6, the mud resistivity was given as 0.58 ohmmeter BHT on the heading. The coincident values of the limestone and normal average 56 ohms when taken over the whole survey and, consequently, $R_m = 0.85$. It is this value which is taken for R_m because it is more nearly correct than the value recorded for the mud sample.

A porosity index for the limestone curve has been placed on the example. This index was obtained by the previously described triangular method, and a portion of the triangle is included to clarify the procedure.

In addition porosity index values for the small normal have been calculated and are included in the following table. This index is also shown on the example.

R_s	R_s/R_m	R_t/R_m	Per cent $p_z = (R_m/R_t)^{1/2}$ (from Fig. 2)
30	35	51	14.0
40	47	77	11.5
50	59	108	9.6
60	70	140	8.5
70	84	190	7.4
80	94	230	6.6

A comparison of the porosity index given by the limestone sonde with that of the short normal indicated very similar values for the interval from 6,875 ft. to total depth. Above 6,875 ft. the short normal does not give sufficiently low levels of resistivity in conductive streaks such as found at 6,840 ft. and, consequently, the porosity indexes may differ somewhat. This is, of course, to be expected in thin conductive intervals.

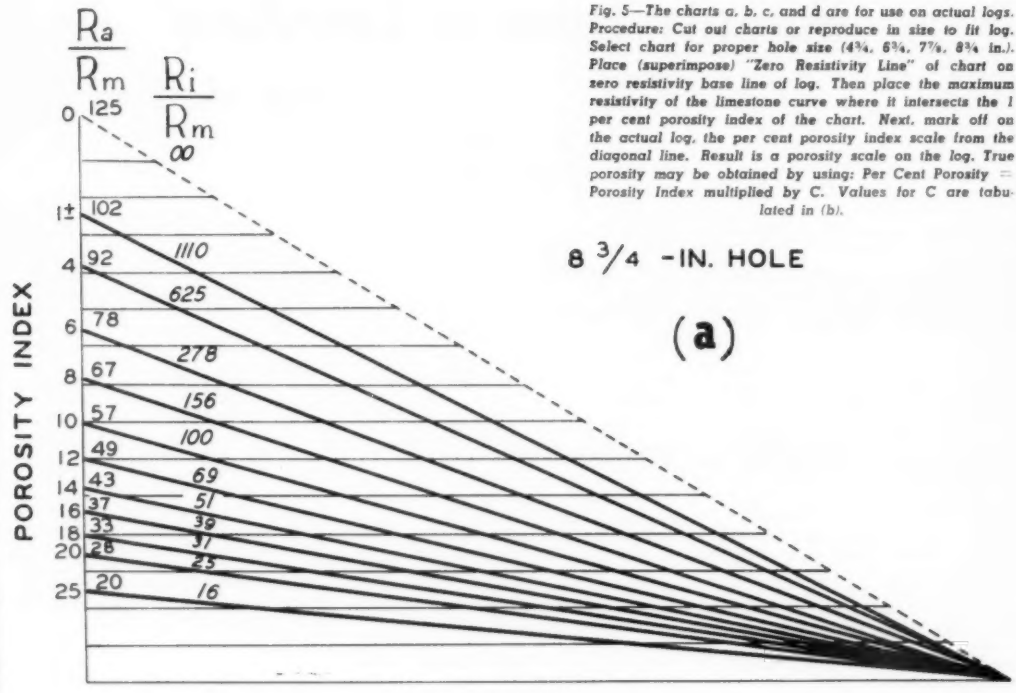
Since the example is oil bearing and has an SP value of approximately —80 mv., the correction factor "C" used to convert porosity index to porosity is close to unity. (See Relation 9.) Therefore, the porosity indices on the example can be compared to the porosities obtained from the cores. It should be noted that the two check very well.

Conclusion

The method given here is only an outline of what can be accomplished. Without doubt, some local variations will be found in practice. The correction factor "C," to be used to translate the porosity index into actual porosity, may have to be determined empirically. So far, it seems that the standard calibration is more or less

*Manager, petroleum engineering, Schlumberger Well Surveying Corp.

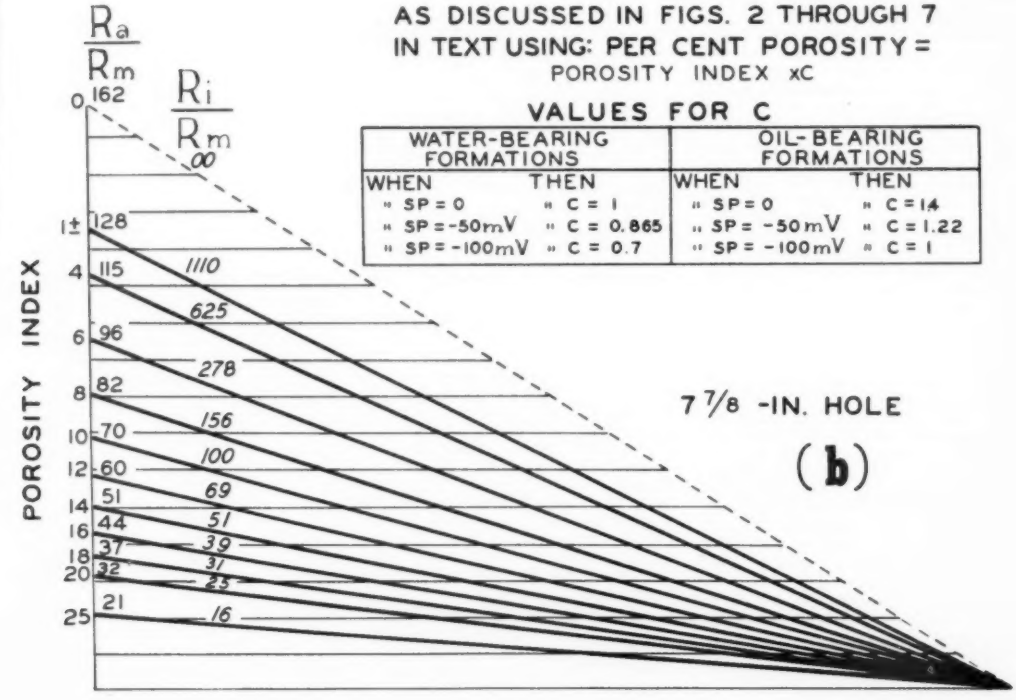
Fig. 5—The charts a, b, c, and d are for use on actual logs. Procedure: Cut out charts or reproduce in size to fit log. Select chart for proper hole size (4¾, 6¾, 7⅞, 8¾ in.). Place (superimpose) "Zero Resistivity Line" of chart on zero resistivity base line of log. Then place the maximum resistivity of the limestone curve where it intersects the 1 per cent porosity index of the chart. Next, mark off on the actual log, the per cent porosity index scale from the diagonal line. Result is a porosity scale on the log. True porosity may be obtained by using: Per Cent Porosity = Porosity Index multiplied by C. Values for C are tabulated in (b).

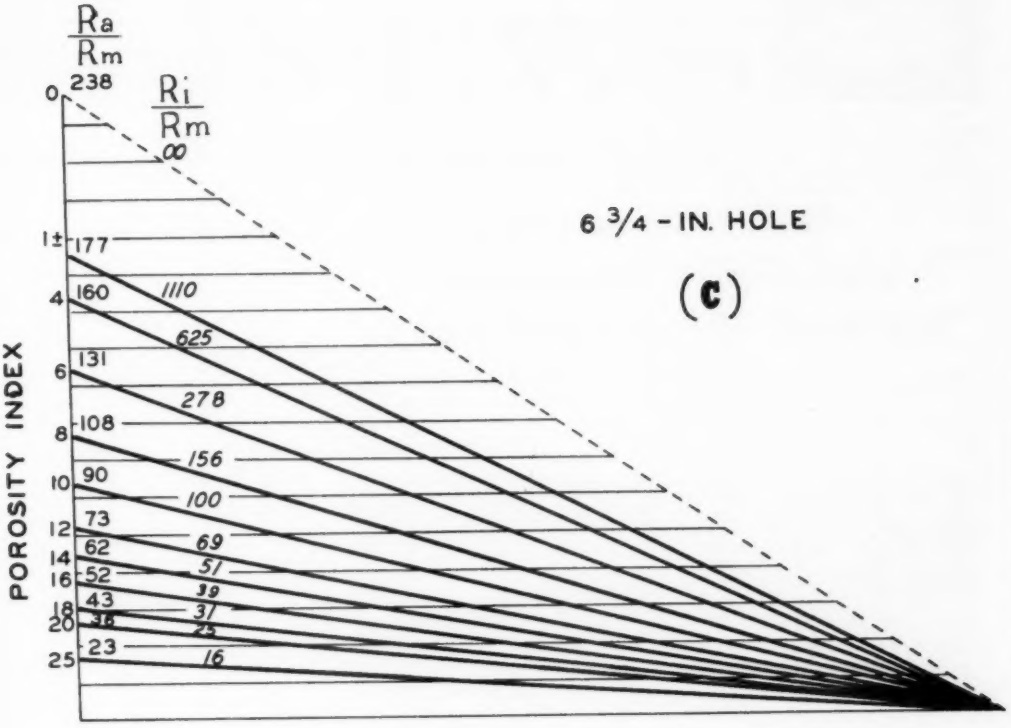


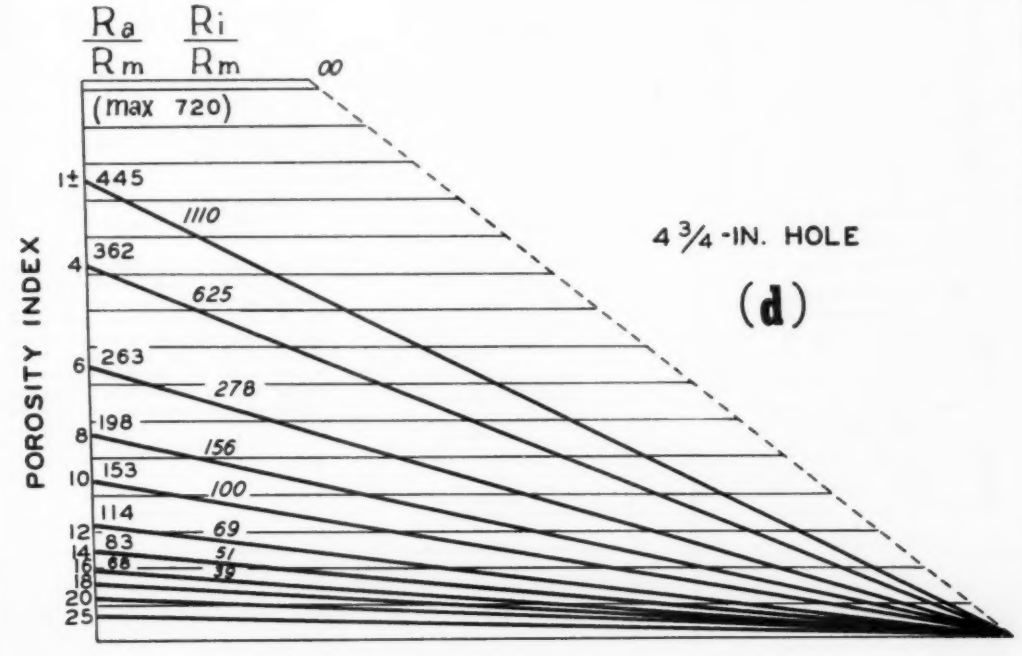
AS DISCUSSED IN FIGS. 2 THROUGH 7 IN TEXT USING: PER CENT POROSITY = POROSITY INDEX xC

VALUES FOR C

WATER-BEARING FORMATIONS		OIL-BEARING FORMATIONS	
WHEN	THEN	WHEN	THEN
" SP = 0	" C = 1	" SP = 0	" C = 1.4
" SP = -50mV	" C = 0.865	" SP = -50mV	" C = 1.22
" SP = -100mV	" C = 0.7	" SP = -100mV	" C = 1




Ra/Rm
Ri/Rm
POROSITY INDEX
0
1±
4
6
8
10
12
14
16
18
20
25
238
∞
177
160
131
108
90
73
62
52
43
38
23
1110
625
278
156
100
69
51
39
31
25
16
6 3/4 - IN. HOLE
(c)


Ra/Rm
Ri/Rm
(max 720)
∞
POROSITY INDEX
1±
4
6
8
10
12
14
16
18
20
25
445
362
263
198
153
114
83
68
1110
625
278
156
100
69
51
39
4 3/4 -IN. HOLE
(d)

universal and can be applied with reasonable safety even though core analysis is not available. The method has now been tested widely enough in the field to justify the inclusion of a porosity index on the electrical logs similar to Fig. 7.

There is no doubt that porosity and saturation in limestones can be obtained from electric logs if an active search is undertaken. It is hoped that the procedures outlined in this paper will aid the oil companies in their studies of the problem.

POROSITY INDEX—"PER CENT DEFLECTION" TABLES (32-IN. LIMESTONE CURVE)

1. 8¾-In. Hole; Limit = 125 R_m; d = 8.2 In.; AO/d = 3.9

R_t/R_m	$p_x = (R_m/R_t)^{1/2}$	R_x/R_m	"Per cent deflection" $125-R_x/R_m$ = 125
1,100	3	102	18.4
625	4	92	26.4
278	6	78	37.6
156	8	67	46.4
100	10	57	54.3
69.5	12	49	60.8
52	14	43	65.6
39	16	37	70.3
31	18	33	73.5
25	20	28	77.5
16	25	20	84.0
11	30	14	89.2

2. 7⅞-In. Hole; Limit = 162 R_m; d = 7.1 In.; AO/d = 4.5

R_t/R_m	$p_x = (R_m/R_t)^{1/2}$	R_x/R_m	"Per cent deflection" $162-R_x/R_m$ = 162
1,110	3	128	21.0
625	4	115	29.0
278	6	96	40.7
156	8	82	49.4
100	10	70	56.8
69.5	12	60	63.0
52	14	51	68.5
39	16	44	72.9
31	18	37	77.2
25	20	32	80.3
16	25	21	87.0
11	30	14.5	91.2

(Continued on page 87)

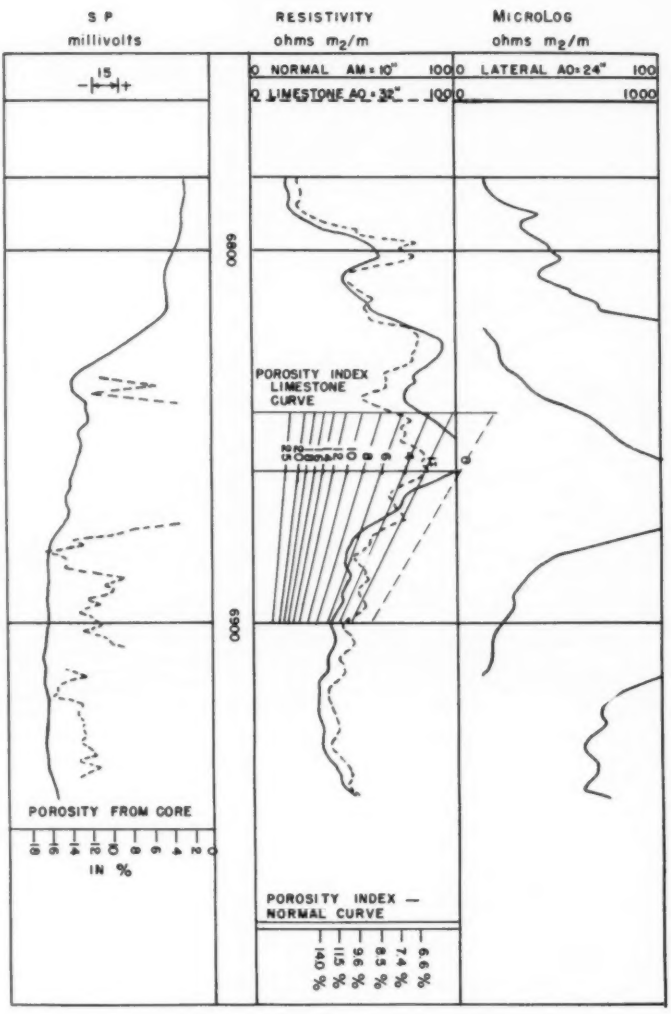


Fig. 6—(Above) Actual example of an electric log, showing how "porosity index" is worked out for the limestone curve.

Fig. 7—The "limestone curve porosity index" method described in the accompanying paper has now been tested widely enough in the field to justify inclusion of special heading on the logs themselves. Illustration shows actual log heading of this type.

Approximate Values of C

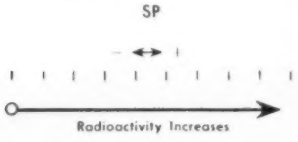
Oil Bearing Limestones and Dolomites

SP	– 100 mv	C	1
SP	– 50 mv	C	1.2
SP	0 mv	C	1.4

Water Bearing Limestones and Dolomites

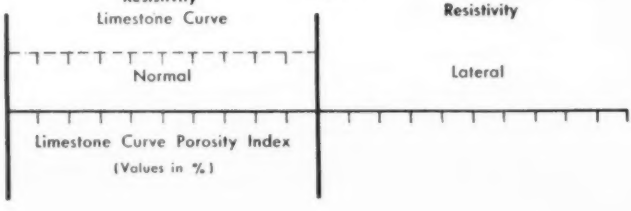
SP	0 mv	C	1
SP	– 50 mv	C	0.86
SP	– 100 mv	C	0.7

* Reg. U. S. Pat. Off.



Requirements

1. Hole to gauge
2. To be used on limestones and dolomites only.
3. Formation invaded by mud filtrate—Check MicroLog*



PETROLEUM CHEMICALS DIVISION
NEWS

November ★ One of a Series of Interest to the Petroleum Industry ★ 1951

WHAT IS TEL?

Motor fuel antiknock compound is made by blending various halogen carriers, dye and kerosine with tetraethyl lead.

When used in an internal combustion engine, tetraethyl lead by itself would form nonvolatile decomposition products which would deposit on the cylinder head and other surfaces of the combustion chamber. To reduce the deposition tendency of these products by increasing their volatility through chemical reaction, scavengers in the form of ethylene dichloride and ethylene dibromide are added. The proportion in which these scavengers are employed is determined initially in laboratory engines and proof-tested in extensive road tests in commercial equipment under actual operating conditions.

Sufficient dye is added to give a distinctive color to the mix as all the other ingredients are colorless or water white. Kerosine in limited amount is used as a standardizing agent to insure uniformity of TEL content in the mix. It is a stable product up to 330°F. but begins to decompose above that temperature.

Du Pont GAS GUARD prevents fuel line freezing

Du Pont Gas Guard is another product designed to help motorists get better car performance. Gas Guard helps prevent ice from forming in gasoline lines of autos, trucks and tractors.

Cold-weather engine stalling, spitting and sputtering due to the presence of water in gasoline can also be prevented by Du Pont Gas Guard. By keeping the system ice-free, it contributes to quicker starting and smoother engine performance, even in sub-zero weather.

One pint of Du Pont Gas Guard in 15 gallons of gasoline, for example, will prevent freezing of as much as 10 ounces of water at 30° below zero F. During moderate freezing and zero weather, a pint of Gas Guard every 1,000 miles of driving will give adequate protection.

It is also highly effective as an antifreeze in diesel fuels. At −24°F., one pint of Gas Guard in 10 gallons of diesel fuel will keep 14 ounces of water from freezing, thus preventing crystals from clogging the jets.

It is harmless to the carburetor, fuel pump and other engine parts when used as directed. Du Pont Gas Guard is distributed in pint cans through service stations, garages and car dealers.

Du Pont Test Fleet Accumulates Deposit Data Under Actual Traffic Conditions

WHEN Du Pont engineers undertook a study of engine deposits and their effect on octane requirement, they determined to make certain that the findings would be of practical value to refiners. To study only the deposits built up in laboratory engines was not enough.

READY FOR A DAY'S TEST RUN, the four Oldsmobiles and four Pontiacs used in the deposit studies are shown with their drivers in front of the Du Pont test fleet garage.

These engineers wanted the study to be truly representative of the deposits accumulated in the average car, powered by average gasoline, under average traffic conditions. But how could they be sure the deposits from any given auto engine would be representative? The Du Pont test fleet provided an answer.

A test course approximating typical highway and city driving conditions was set up. About 64% of the course was through downtown Philadelphia traffic. The remainder over nearby country roads.

Starting with deposit-free engines, eight cars were driven over the course daily until a total of 8,500 miles was recorded on each car. Four of the cars were 1950 Oldsmobile 98's with hydromatic transmissions. The other four were 1947 Pontiac 8's with 1948 engines and standard transmissions.

Before starting the test, each car was road-checked for gasoline mileage, acceleration time and octane requirement. The engines were not "doctored" in any way. Each was tuned up according to the manufacturer's standard specifications . . . and kept that way until completion of the test. To assure uniform operation, distributor settings were constantly checked throughout the test.

The fleet was set up in pairs of cars. Each pair used identical fuels and lubricants. This made it possible for the performance of one car to be checked against that of its identical mate . . . an additional assurance of uniform engine performance.

The cars were operated as a group, although no attempt was made to maintain exact formation in heavy traffic. The city course was covered several times each day. This helped to vary the traffic density conditions and the amount of start-and-stop driving . . . with each car encountering about the same conditions during a day's run.

The cars were equipped with recording tachographs to give an accurate account of their individual operations.

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OVER

PETROLEUM CHEMICALS DIVISION
NEWS

CONTINUED

Test Fleet

These instruments helped supply many valuable statistics. For example, they showed that during a 5-day period the average number of stops per car per 8-hour shift was 328. And all these stops occurred in an average of 101 miles of operation.

Sixteen drivers, working two shifts, participated in the test. To control the driver effect, the men were alternated so that each car was driven approximately the same time and mileage by all drivers.

A driver-leader was in charge of each shift. The leaders were responsible for the safe performance of the fleet in the field.

Driving safety and courtesy is emphasized in all Du Pont test fleet operations. In addition to turning in an excellent safety record, the fleet drivers were able to help several motorists in trouble on the road. For example, since all test cars carried fire extinguishers, the Du Pont drivers were in a position to put out a number of highway auto fires which might otherwise have been both hazardous and damaging.

At 8,500 miles the test car engines were taken down and the quantity and composition of their deposits investigated. As was expected, much

THE TWO DRIVER-LEADERS are also trained mechanics. Here they are inspecting the torn down engines of the eight cars used in the recent Du Pont deposit studies.

new information was gained from the test. This, along with other data, was evaluated at the Du Pont Petroleum Laboratory and the results are now available to refiners in a paper recently published. This paper was presented by L. F. Dumont of the Petroleum Laboratory staff at the June S.A.E. meeting in French Lick, Indiana. Reprints of the paper with the title, "Possible Mechanisms by which Deposits Accumulate and Influence Knock" are available on request.

Du Pont test fleets constantly work on road tests of this type. In addition to the one described above, a 5,200 mile test with "dirty" fuel has just been completed. And another deposit study is now being made with the Du Pont heavy-duty truck fleet in El Monte, California.

Assistant Director of Petroleum Laboratory

W. E. BETTONEY

W. E. BETTONEY was appointed Assistant Director of the Du Pont Petroleum Laboratory in June of this year. In this capacity he directs work on combustion chamber deposit studies and other petroleum research projects. He is also in charge of test fleet operations. Previous to this assignment, Bettoney headed the Engineering Division of the Laboratory.

He came to Du Pont in 1946 from Universal Oil Products. With the Chrysler Corporation during World War II, he worked on the development of B-29 engines at the Dodge Chicago plant. Before this, Bettoney spent three years as a government test engineer on full-scale experimental airplane engines at Wright Field.

He graduated from the University of Maine with a B.S. in mechanical engineering and did graduate work at Columbia and New York Universities.

New TEL Blending Chart for Laboratory Convenience

A reference chart for blending Du Pont Tetraethyl Lead Compound—Aviation Mix with small quantities of gasoline is now available to refiners. It was prepared by Du Pont to aid laboratory personnel in the leading of test fuels and samples.

In table form, the chart shows the number of milliliters of Du Pont Aviation Mix required for fuel samples from 1 to 20 liters and from 0.1 to 100 gallons. Any desired concentration from 0.1 to 6.0 ml TEL/gal. can be prepared from the table.

In addition, information on the properties, composition, conversion factors and dye concentrations of Du Pont TEL Aviation Mix is included on the reverse side. Ask the nearest Du Pont district office or write direct to Du Pont for your copy.

MOVIES AVAILABLE

Prints of the following Du Pont films are available to oil companies for training and public relations purposes. They may be borrowed or purchased. Address request to nearest Petroleum Chemicals Division district office.

Pipeline on Wheels—A 26-minute, full-color movie on tank truck safety. Suitable for both training and public relations purposes.

What Makes A Gasoline Good—An 18-minute cartoon movie in color. Presents the story of how high quality gasoline is made in easy-to-understand form. Ideal for dealer training meetings.

In addition to the above, Du Pont makes available a special library of films of particular interest to the petroleum industry.

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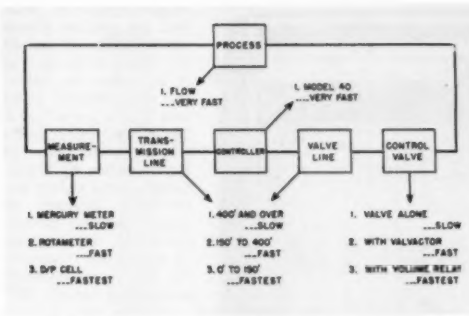


Fig. 1—Control loop, indicating speeds of components.

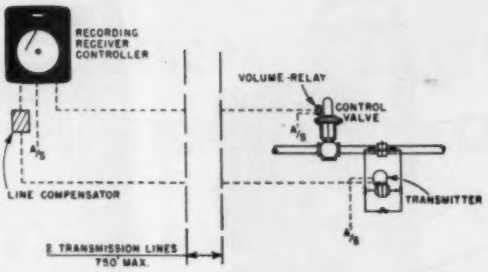


Fig. 2—Flow control with controller at central panel.

FAST CONTROL LOOP

How to get greater stability in refinery-process operation through new developments in flow control

by V. V. St. L. Tivy*

FLOW control is of prime importance to refinery process operators. Flow controllers comprise over 50 per cent of all controls used in the refinery.

Poor flow control may often be due to the use of long transmission lines. One way of minimizing transmission lag is to use a line compensator and/or a volume relay placed on the control valve.

Another method employs a newly developed controller placed on the control valve and operating with fixed settings of proportional band and reset. Those portions of the controller mechanism associated with conventional adjustable settings are eliminated, resulting in a compact controller suitable for field installation at the valve.

*Manager, refinery sales division, Foxboro Co. Paper presented at A.S.M.E. petroleum mechanical engineering conference, Tulsa, September 24-26, 1951.

In the last few years much attention has been devoted to the complete controller loop. With good control mechanisms and good measuring elements only a part of the job is done. The control valve itself, transmission lines, and the process must be evaluated properly and improved where necessary.

The whole object is to obtain an over-all fast control loop. Substantial improvements in speed of response in measuring devices for temporary and flow have been made in recent years. These advantages are frequently lost because the fast elements are grouped with others which are slow. That is why not only the individual components but also the entire control scheme must be considered when selecting control equipment. In this way fullest advantage may be taken of the latest improvements in sensitivity and response of the newer measuring devices.

Transmission lines.—The block diagram of a flow control system is shown in Fig. 1. It is common knowledge that a change in the valve position produces an almost instantaneous change in flow at the orifice when both orifice and valve are in the same line. The time taken for an input signal to a pneumatic controller to be transformed into a change in output pressure is so small that it can hardly be measured. Hence, we rate the speed of response of these two elements of the control loop as "very fast." Now that we have the highly responsive differential pressure transmitter rated as "fastest," the transmission lines and control valves become the dominant factors in the control system.

A paper by Catheron[1] given last year showed why the speed of the control valve is important and he suggested a particular volume relay as a means of improving valve speed. There was still left the time delay of the transmission lines, and where these were known to be long, poorer control could be anticipated. Further studies into flow control were made by Vannah[2] who reported his findings in a paper given at the 1951 na-

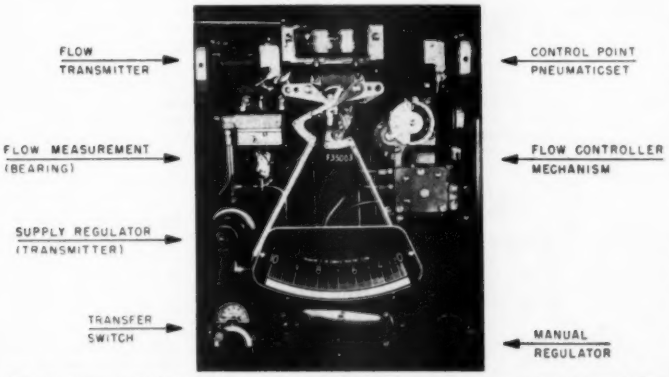


Fig. 3—Flow control. Local mounted controller with remote-set control point and flow transmitter.

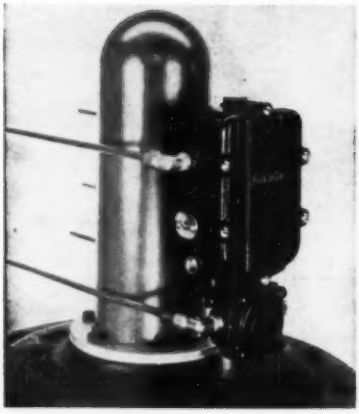


Fig. 4—Compact controller mounted on the valve.

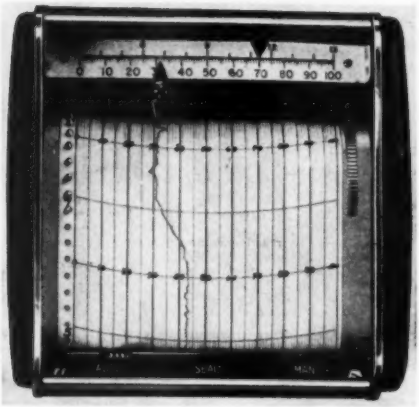


Fig. 6—Recorder and control-point mechanism.

tional conference of the Instrument Society of America. He shows how quite long transmission lines can be used without sacrifice of good control by adding to the controller a device called the "line compensator." Examples of excellent control with long lines are shown and the system is recommended where it is desirable for the control mechanism to be mounted on a central panel and where the length of transmission line is significant. The system is illustrated schematically in Fig. 2.

It was apparent within a short while after the satisfactory development of a good "fast" differential pressure transmitter that better flow control was obtained when shorter transmission lines were used. The natural reaction was to devise a method whereby the transmission line could be reduced to zero. (In common parlance, "to locate the controller at the valve.")

Interestingly enough, this thought had occurred to a number of engineers and in fact some equipment along these lines was built at the suggestion of, and shipped to, Union Oil Co. in Los Angeles as early as 1947. Their problem was one of flow control to furnaces where long transmission lines were causing poor control. One of these early instruments is shown in Fig. 3. To the forward-thinking engineers of this oil company should go much of the credit for the present excellence of automatic flow control. The trend they started has undoubtedly gone far beyond the extent anticipated at that time.

Controller on the Valve

There was a strong objection, on the part of many people, to putting a somewhat complicated device like a controller in the process area subject to noxious atmospheres, weather, requirements of winterizing and in places where often it would be difficult to get at it in order to adjust its proportional band and reset values. There had been sufficient difficulty in maintenance of transmitters and valve positioners, neither of which need to be adjusted to the process, to cause the question, "is the improvement in control worth it?"

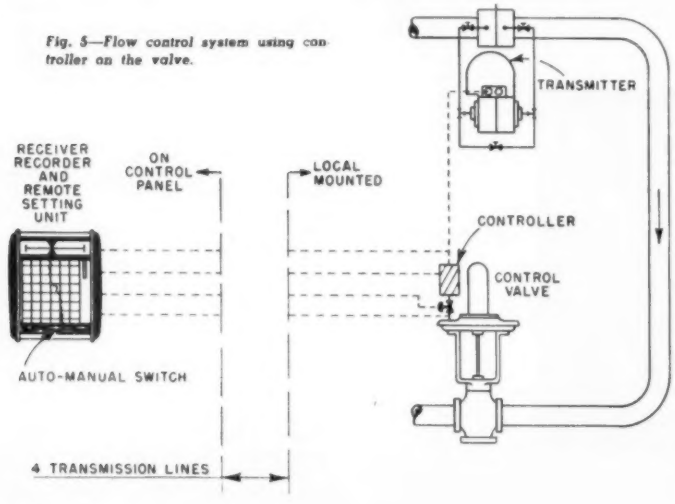
Nevertheless, the impressive results reported[1] by those engineers not afraid of transgressing the bounds of convention required that the whole subject of flow control be examined with the aim of obtaining the best control where long transmission lines are involved and without incurring the problems noted above. The work done by Catheron and Vannah[1,2] shows the way to a satisfactory solution where transmission lines can be kept within reasonable limits. Extensive investigations beyond the scope reported in their papers were conducted on the plant-scale flow system set up in a laboratory.

It was soon found that where orifice and valve are in the same line the "flow process" always has the same control characteristics (very fast) regardless of line size, flowing liquid or head producer. If the transmission line is restricted to 100 ft. or less (very fast); if a differential pressure transmitter of the diaphragm type is used (very fast); and if the controller is mounted directly on the control valve, then all such control systems will differ only as the size of the diaphragm motor on the valve.

Loop characteristics predicted.—The significance of the conclusion reached above is that it is possible to arrange the great majority of our flow control systems so that controlwise they are similar except for differences in control valve speeds. Since one can predict these speeds easily, it follows that the characteristics of the complete control loop can be predicted exactly.

Heretofore all controllers have been provided with adjustments for proportional band (sensitivity) and reset (time) so that the controller can be matched to the different characteristics of the various processes. With predictable characteristics of the complete system, adjustments seem needless and although it might seem that a different controller would be needed for each size of control valve, it has been demonstrated that control with the very fast system is so good

Fig. 5—Flow control system using controller on the valve.



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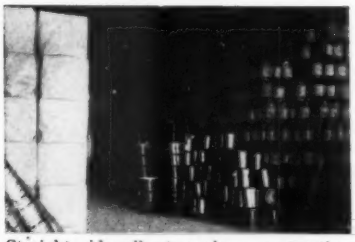

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Experiments with several different sizes of control valves showed that a controller correctly adjusted for a small valve could be used untouched with much larger valves with but insignificant and generally undetectable deterioration in control. The tests encompassed the full range of diaphragm operators to be found in any refinery.

Fixed settings. — Following upon this work a controller (Fig. 4) with fixed settings of proportional band and reset has been designed and tested. Unexcelled flow control is obtained when it is used in a liquid flow system.

An appreciation of a few details about the controller will explain the full significance of the development. (1) There is nothing to adjust, (2) the case is completely and positively sealed and the pressure inside the case is always valve pressure, (3) the exhaust port can be piped to a remote point or provided with a check valve. Thus, we now have a controller suitable in every respect for mounting on the control valve and completely protected from surrounding atmospheric conditions. Work continues and its performance in the broader aspects of flow control will be evaluated and reported. The controller and its place in the general scheme is shown schematically in Fig. 5.

The result of this work is that now the benefits of the fast control system, available in temperature control, systems are now also available in flow control with a choice of controller location.

Graphic Panels

The last few years have witnessed great agitation in the field of instrumentation. It might well be said that industry has embarked with the greatest gusto upon the era of the "graphic panel." The graphic panel is built around a collection of instruments which are functionally similar to those with which we have become familiar but which differ in one respect—they are much more compact and occupy a panel space generally of the order of one-tenth of that previously required.

While the merits of the graphic panel can be argued ad infinitum, two basic facts cannot be questioned: (1) One particular arrangement of a given group of instruments on a panel, pictorial or otherwise, cannot possibly make them work any better than another. Stated differently—instruments cannot perform any better because they happen to be mounted on a graphic panel. (2) The greatest payoff to the refiner comes when his automatic control system performs the longest at the level of its best performance.

In the quest for better and better

performance in the refinery, one must logically examine the latest instrumentation developments in the light of (2) above ignoring the many advantages that the so-called "miniature" instruments offer to the graphic-panel designer. Considered in this respect, it seems doubtful that graphic-panel instrumentation can claim any advantages in the field of temperature, pressure, and level control. However, the control of flow has undoubtedly been greatly enhanced by this line of instruments. (It is worth noting that, in general, flow controllers comprise well over 50 per cent of all controls in the refinery.) The improvement lies in one superficially insignificant fact, namely, the separation of the flow recording and controlling mechanism.

Flow control.—Heretofore all flow measurements have been damped. Even when inherently fast sensing devices were used, they were artificially damped so that the recording pen would draw a readable record, and because the conventional instrument was a recorder-controller, it followed that the controller mechanism was also damped. The importance of "speed response" in the measuring circuit had not been evaluted properly perhaps. The phenomenon of "noise" and its impact on fast flow measurement is fully discussed in Catheron's paper[1].

In graphic-panel instrumentation the controller is generally separate from the recorder or at least it uses a separate measuring element; consequently, the recording element may be damped as before without in any way reducing speed of response of the controller element.

It is at once apparent that the flow controller described in the preceding paragraphs lends itself particularly well to the scheme of instrumentation generally accepted in graphic-panel work. With the recorder and control point setting mechanism (Fig. 6) on the panel, it is convenient to mount the control mechanism in the field (on the valve) since there are no adjustments to make at the controller.

Fast control loop. — Refineries in which the new fast form of flow control is used have shown substantial gains in process operation. The choice between controller mounted at the panel using line-compensator and/or volume relay or controller at the valve is one that can be made individually. Plant factors, personnel likes and dislikes, maintenance problems and the like will often dictate one form or the other.

The important thing is the use of the control loop which often gives startling benefits in the general stability of the entire refining unit. For example, it is general practice to put a flow controller on the line by bringing the flow to a desired value manually and then with correct manipulation of the instrument perform a "bumpless" transfer from manual to automatic control. The whole process is somewhat time consuming at a time when the operator has many other things with which to concern himself. Consider the great simplification when, to do the same job, one merely sets the instrument control index at the desired value, leaves the transfer switch on automatic control, and starts up the pump. Within a second after the pump has picked up suction the flow is lined out smoothly at the control point. This, the modern standard of flow control, is now considered routine.

Acknowledgment

Behind the various statements made in this discussion lies a tremendous amount of patient and painstaking work. To Messrs. Catheron, Bowditch and Vannah and their colleagues in the research department of Foxboro Co., the writer is indebted for permission to "plagiarize" their work.

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2. Vannah, W. E. and A. R. Catheron, "Improved Flow Control With Long Lines," paper presented at 1951 national meeting of I.S.A.

3. Boyd, D. M., "Process Control by Graphic Panel," The Oil and Gas Journal, September 15, 1949, page 86.

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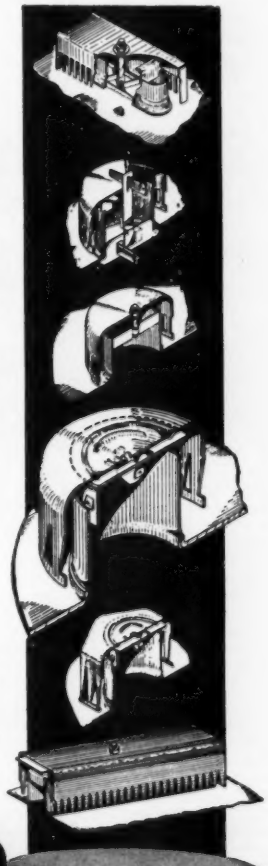

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That Spectacular Spraberry

A SYMPOSIUM ON WORLD'S LARGEST OIL FIELD—PART 1

Drilling and Casing Procedures

by John L. Cox
Texas Crude Co., Midland, Tex

This paper includes various drilling methods and procedures being used by different operators and contractors throughout the Spraberry trend. This particular part of the discussion includes only drilling to the oil-string point, including setting of the oil string. As of October 1, this year, approximately 528 wells had been completed in the main producing area. The drilling-technique committee has obtained data on procedures and problems encountered in drilling 274 of these wells. This paper touches only briefly on mud programs as a separate paper on the subject is included in the Spraberry Symposium report.

TWO different methods of drilling to the top of the Spraberry are most commonly used. One method is to drill a large hole to the first limestone encountered (approximately 3,800 ft.) and set a salt or intermediate string, then drill to the top of the Spraberry with the salt section cased off. The other method is to drill a hole of sufficient size below the surface pipe to the top of the Spraberry to enable setting of a long string of 5½ or 7-in. oil string. Generally speaking, drilling in the Spraberry area is good and drilling time proves this point. One contractor set the oil string in 21 days after spud date. This is the best drilling time that has been reported; however, the average drilling time for 274 wells was 33 days, including time for setting pipe. In some of the rotten sections below the top of the San Andres as much as 1,000 ft. has been drilled in a 24-hour period.

Drilling Practice

The number of drill collars used, r.p.m. of rotary, pump pressure, etc., vary with the different drilling contractors. Some contractors have more or less standardized on a limited number of collars, fast rotation of table, and high pump pressure while making hole to the first lime section or to 3,800 ft. They use only three drill collars, run the rotary table upwards to 125 r.p.m., and use as much water as is available (this might be classified as washing the hole down).

After encountering the lime section, the practice is to use from 16-25 drill collars while making the hole to the casing point. This method is not used by all contractors as others use 12-18 drill collars below the surface pipe and keep their drill pipe in tension at all times. When drilling by this method the rotary speed is cut to approximately 50-60 r.p.m.

Availability of water has been a problem in Tex-Harvey field proper and in some instances lack of water has slowed down drilling operations. This situation has been relieved recently by installation of a water pipe line to the field. Other areas throughout the trend have enough water to carry on normal drilling operations. This water is found in depths ranging from 60 ft. in Germania field to 220 ft. in the Weiner-Floyd area. To insure proper care of these water sands all operators set a minimum of 120 ft. of surface pipe in the Germania and 300 ft. of surface pipe in the Weiner-Floyd area. Cement is circulated behind this pipe.

In general, it takes approximately 12 bits to drill the intermediate hole with the 11 and 12¼-in. bit being most popular. Approximately 15-20 bits are necessary to make the 7¾ or 8¾-in. hole below the salt string. In drilling a long string 30 bits has been the average while drilling an 8¾-in. hole.

In the author's opinion it took longer to drill wells when drilling without a salt string. However, from an average of the 274 wells on which

The host of Spraberry oil operators, and in fact a good part of the United States oil industry, owe a debt of gratitude for the foresightedness and energy of W. J. Murray, Jr., member of Texas Railroad Commission and chairman, Texas Petroleum Research Committee, and Dr. G. H. Fancher, director, T.P.R.C., for their work in programing T.P.R.C.'s Third Oil Recovery Conference held at Midland, Tex., October 19-20, and devoted exclusively to a "Spraberry Symposium."

There is a tremendous problem in the drilling-development and high ultimate recovery attainment from the huge and rapidly developing Spraberry trend — which is by far the largest oil field in the world from standpoint of area.

This section is a Part 1 installment in the Journal, reporting this Spraberry Symposium, and additional sections will appear in subsequent issues.

W. J. MURRAY, JR. *G. H. FANCHER*

For Journal readers building up an engineering file on Spraberry material, previous article references in The Oil and Gas Journal include:

"Theories of Spraberry Fracture Pattern and Origin," October 25, 1951, page 76.
"Plans for Change in Spraberry Spacing Rules," October 18, 1951, page 72.
"Is World's Largest Oil Field Looming Up in West Texas?" October 11, 1951, page 98.
"Future Development of Spraberry in West Texas," October 11, 1951, page 85.
"How to Best Produce Spraberry Oil and at Same Time Save Tubular Goods," October 4, 1951, page 150.
"Spraberry Drilling Activity Exceeds All Previous Plays in West Texas Area," by J. H. Bartley, August 16, 1951, page 128.
"Carl King Using Compressed Air Instead of Mud," June 21, 1951, page 152.
"Spraberry Sand Undergoing Rapid Development," June 21, 1951, page 149.
"Midland Basin's Spraberry in Limelight," May 15, 1951, page 163.
"Drilling and Production Practices in West Texas' Spraberry Fields," February 22, 1951, page 197.

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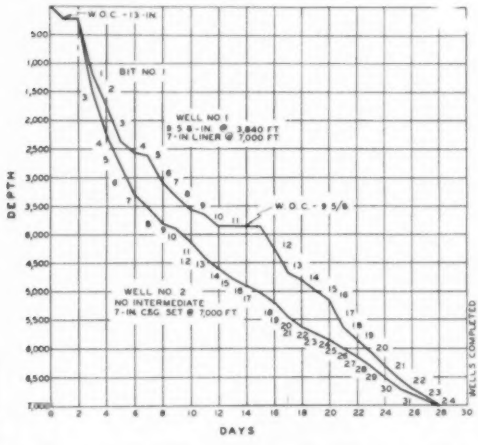

Fig. 1—Drilling-time comparison, salt string and liner vs. long oil string, no intermediate.

data are accumulated there was no difference in drilling time for the 110 wells that were drilled without an intermediate when compared to the 164 wells which reported a salt string. Both methods have an over-all drilling time to set pipe as 33 days. Fig. 1 will illustrate this point. Two offsetting wells were used in this comparison—one set 9⅝-in. casing at 3,840 ft. and 7-in. liner at 7,000 ft. The other well set a 7-in. long string at 7,000 ft. It took 30 days for both wells to drill to 7,000 ft. and set 7-in. casing. The first well needed eleven 12¼-in. bits and thirteen 8¾-in. bits. The second well needed thirty-one 8¾-in. bits to drill the 7,000 ft. A brief review of the mud programs used in drilling these wells follows:

Intermediate string.—Only a very small amount of lost circulation has been reported when the salt string is set in the Greyburg. A majority of the operators use clear water all the way to just above the liner seat—then a small amount of gel mud is mixed prior to running logs and pipe. This type mud program cost approximately $750 per well.

Long string.—The general procedure is to mud up at approximately 4,000 ft. with a very light oil-emulsion mud—the code is to use as light a mud as is possible. The cost range is varied between $1,000 and $10,000 with an average of $3,000 per well.

One operator recently lost circulation at 4,240 ft. and tried 24 cement jobs along with other jobs, and used 60 tons of lost-circulation material without success. Approximately 65 days was used in trying to regain circulation (pipe was run to 4,000 ft. without success). Finally the operator used one fluid control jet at 3,800 ft. from surface, with a surface pump pressure of 1,000-1,200 psi. through 2⅞-in. drill pipe. This was successful in regaining circulation and finishing the hole in approximately 20 days after putting the jet in the string. This was the only well reported where lost circulation could not be regained by cementing. Probably fewer than 5 per cent of the total wells drilled have found it necessary to use cement to regain circulation.

Only in two instances have high-pressure zones above the Spraberry been encountered. Air pockets in the salt section at 2,200 ft. were found in two wells. In both cases, these pockets exhausted themselves while drilling ahead. These zones had pressures estimated upwards to 3,500 psi.

Pipe Program

Fig. 2 illustrates the different pipe programs that have been used in the area; also, the total tonnage used in each string of pipe (excluding tubing). Due to the scarcity of steel, operators are very conscious of how much tonnage is being put into the ground. Due to the risk involved in drilling a well without an intermediate string and high cost of mud it is evident that the operators are sacrificing additional money needed in drilling a well in order to use a lesser amount of steel tonnage.

Where operators have run an intermediate string fewer than 5 per cent have circulated cement. It has been beneficial to the operator to use a salt-saturated mud through the salt section when they anticipated circulating cement and still approximately 3,500 cu. ft. of cement is needed. When only fresh water was used while drilling through the salt section it required upwards to 5,000 cu. ft. for circulation. Most operators use gel and Peralite mixtures in cementing.

For the most part, liner cementing has consisted of cementing from the bottom and then squeezing the top of the liner through retainers. However, one operator has made a practice of cementing the liners from bottom to top. Usually three stages are required to bring the cement from the bottom to top. Due to bridging and porous zones between 4,000 and 7,000 ft. very little success has been experienced in circulating cement at the initial setting of the liner. Most operators use gel and Peralite material in an effort to lighten the slurry and eliminate bridging and down-hole channeling.

Setting depths above the Spraberry vary as to operators—generally most operators have reported setting the oil string between 10-60 ft. above the pay.

Regarding down-hole channeling of cement experienced in the Spraberry, some operators are placing a cement or plastic plug in the bottom of the hole prior to running pipe. Just how this will prevent channeling is questionable and is not recommended by the author. It is believed that no scratchers of any type have been used in the area and fewer than 25 per cent of the wells drilled use centralizers.

In a majority of the wells in the area logs have been run to the top of the Spraberry. These logs will be helpful in correlating shallow zones which might prove to be commercial when the operators have time to check what is or if anything is being passed up.

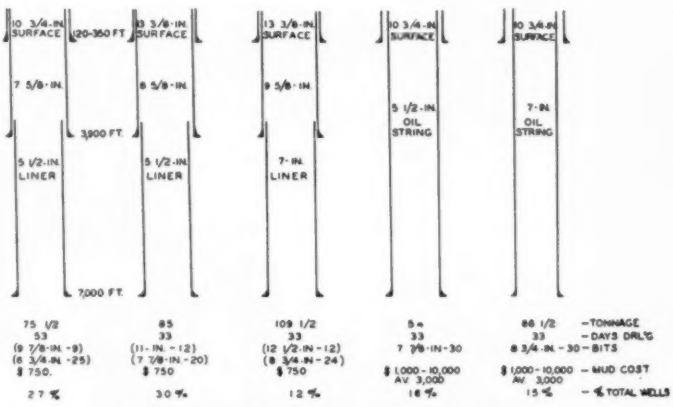

Fig. 2—Diagram showing casing program in Spraberry trend.

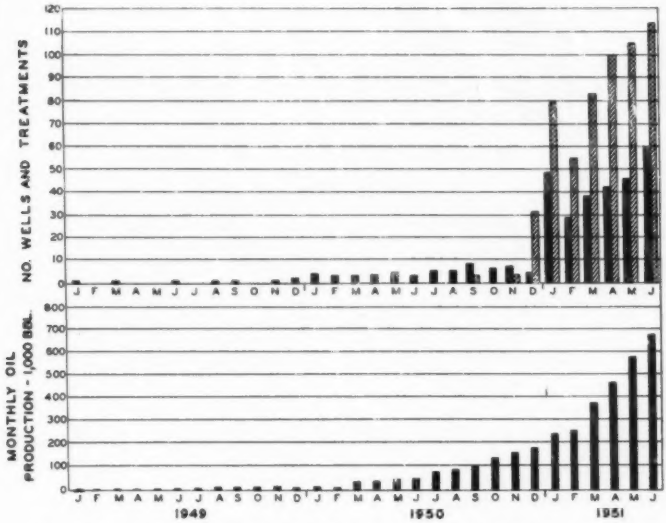

Fig. 1—Graph showing monthly oil production, number of wells, and treatments.

Hydrafrac Operations

by Waldo L. Grossman

Division engineer, Halliburton Oil Well Cementing Co., Midland, Tex.

Application of the Hydrafrac process to wells completing from the Spraberry formation was begun during the last part of 1950. The Hydrafrac process consists of preparing a viscous gel to which a special sand is added and pumping this material into the producing formation at a rate which will develop sufficient hydraulic force to produce and/or extend a fracture. The gel must be of an unstable character to revert to a thin fluid, such that it may be recovered from the well, leaving the introduced sand in the fracture as a propping agent. In order to insure the reversion of gel to a fluid, breaker chemicals are mixed with crude oil and flushed into the formation behind the gel. The success of these treatments has been closely associated with the current expanding drilling and development program along an area commonly referred to as the "Spraberry trend."

RESULTS of all treatments have varied considerably. Probably one of the best indicators of the general success of the process is the 1,046 treatments performed. Additional experience in the several means of Hydrafrac application will better enable evaluation as to the best possible method of treatment.

The solid bars in the upper portion of Fig. 1 show the number of wells completed each month for 15 Spraberry fields from January 1949 through June 1951. The crosshatched bars indicate the number of Hydrafrac treatments each month during this period. From this graph, it may be noted that the rapid development of the Spraberry has been closely associated with the introduction of the Hydrafrac treatments.

Oil production by months is shown in the lower portion of Fig. 1 for the same fields for the same period. Current production has exceeded the rate of 1 million barrels per month.

Mixing of Material

The gel consists of a mixture of kerosine, water, and oil-soluble soap. Kerosine is used because it is generally a reliable standard fluid. The small volume of water is added to insure a breakdown of the gel. The oil-soluble soap is the gelling agent. The size of treatment is often called a two, three, or four-batch job. A batch includes the following materials: 750 gal. of kerosine plus the necessary chemicals to form the gel. The gelling agent is a time-and-temperature-sensitive material; consequently, the kerosine should be at a proper temperature for mixing. This requires the use of a steam unit during the winter months.

After the mixture has gelled properly, it is ready to be pumped into the well. As it is being pumped into the well the special sand is added, normally in the amount of 400 lb. per batch or about ½ lb. per gal. The breaker fluid consists of crude oil and a small amount of special chemical. The normal amount of breaker fluid used is twice the amount of gel fluid.

Although the addition of water to the gel should insure a breakdown of the gel within a reasonable time in wells with bottom-hole temperatures above 115° to 125° F., it was originally felt desirable to follow the gel with an external breaker fluid as additional insurance. For wells with lower bottom-hole temperatures, an internal breaker chemical is added to the gel. After the gel and breaker fluid have been displaced into the formation, the normal practice is to close the well in and allow the fluids to remain static for a minimum period of 8 to 12 hours. After this time, the gel should have become fluid and the well may be swabbed or pumped in order to be placed on production.

Method of Treatment Application

The various methods of treatment application from September 1950 through September 1951 are indicated in Table 1.

The method of performing a Hydrafrac treatment may be generally classified as an open-hole or a casing-perforation treatment. Open-hole treatments may be divided into two general classifications either with a packer or without a packer. Three different types of packer arrangements may be used. These are:

1. Packer set in casing—treat the open hole below casing shoe to total depth.

2. Single formation packer set in open hole, generally treat from packer to total depth. Treatments of open hole above packer to casing shoe have generally resulted in a fishing job.

3. Straddle-type formation packer with one or both elements set in the open hole—treat open hole between the two packer elements.

Most every one is familiar with the general design and mechanical operation of conventional hookwall casing packers and formation anchor packers. However, the hydraulically operated straddle packer is a relatively new tool originally designed for Hydrafrac operations. All of the open-hole and some of the casing-perforation treatments through a straddle packer have used this hydraulically operated tool which is set by pump pressure applied from the surface.

TABLE 1—METHOD OF TREATMENT APPLICATION

	Open hole							
	With packer					Casing perf.		
1950—	Casing packer	Formation anchor-packer	Straddle packer	No packer—Tubing	No packer—Casing	Casing packer	Straddle packer	Total No treatments
September	1	1				1		3
October								0
November		3						3
December	5	3	17			2	2	31
1951—								
January	9	10	44			16		79
February	4	18	22			7	3	54
March	10	24	33			11	5	83
April	25	31	36			4	4	100
May	22	37	33			3	10	105
June	24	23	53			11	3	114
July	47	37	45			15		144
August	63	30	65	2		12		172
September	64	26	57	1	1	7	2	158
Total	274	245	405	3	1	89	29	1,046

The main features of this tool are—

1. Available in two sizes:

(a) A 4⅜-in. o.d. tool which may be dressed with 4⅜-in. o.d. packer elements for use below 5½-in. casing in 4¾-in. hole. Also may be dressed with 5⅝-in. packer elements for use below 7-in. casing in 6⅛-in. hole.

(b) The 5⅝-in. o.d. tool may be dressed with following size packer elements:

A 5⅜-in. packer used below 7-in. casing in 6⅛-in. hole.

A 6¼-in. packer used below 7⅝-in. casing in 6¾-in. hole.

A 7-in. packer used below 8⅝-in. casing in 7⅞-in. hole.

An 8-in. packer used below 9⅝-in. casing in 8¾-in. hole.

2. Tool consists of two 40-in. packer elements which may be spaced from 5 ft. to any multiple of 5 ft. apart before starting the tool in the hole. Most treatments have used between 30 to 60-ft. spacing.

3. The tool may be set, treated through, moved, and reset several times without coming out of the hole.

4. Each packer element is set with the same force, equivalent to 21,200 lb. weight for the 4⅜-in. tool and 36,000 lb. weight for the 5⅝-in. tool, if 4,000-psi. setting pressure is applied at the surface. This force is independent of setting depth or size of tubing or drill pipe.

5. The tool is essentially pressure balanced; no slips are required to hold the packer in place. A bypass is built in the tool from the annulus above the top packer element through the tool and spacer elements to the open hole below the bottom packer element.

6. A circulating valve is run above the tool.

7. A bumper sub is run above the circulating valve.

8. The tool is complicated only with regard to its manufacture and servicing. It cannot be properly serviced on the rig floor. However, its operation is simple. Reciprocating movement of tubing or drill pipe operates the tool. Rotation of tubing or drill pipe operates the circulating valve.

9. As many as five treatments through this tool have been performed during an 8-hour period. Three treatments in such a period are common operations.

Open-hole treatments without the use of a packer may be of two classes. These are:

1. Tubing in the hole—materials may be spotted to bottom through the tubing or annulus and the squeeze performed by pumping down the annulus and tubing.

2. With no tubing in the hole, all materials pumped directly down the casing.

Treatments through casing perforations may be either of two types—they may be either above or below a single casing packer. None have been reported performed above the packer as of this date. They may also be performed between straddle-type packers.

It can be readily seen from Table 1 that the open-hole-type treatment predominates. On those treatments where a packer was used, all of the various methods were commonly used. During the past 3 months, the percentage of treatments using only a casing packer has increased. The figures shown under the heading "Straddle Packer" indicate the number of treatments and not the number of wells treated. The number of such straddle-packer treatments per well have varied from one to seven. The average is about three treatments per well.

The treatment of open hole without the use of a packer has been a recent development. This method has been used in order to eliminate the loss of pumping horsepower as tubing friction. Injection rates of 10 to 15 bbl. per minute with surface pressures from 1,300 to 1,500 psi. have been obtained using this procedure.

Treatments through casing perforations whether of the single casing packer or straddle-packer type were generally performed on two classes of wells. First, dry holes or depleted wells from pre-Permian formations and, second, new wells. In wells of the first type, it was necessary to set casing through the Spraberry to test or produce these lower formations. Most of the earlier casing perforation treatments were on this type of well. As a result of the success of Hydrafrac treatment on some of those wells, especially in the Benedum area, some operators are now setting casing through the Spraberry in that area and completing with Hydrafrac through perforations on new wells.

Size of Hydrafrac Treatment

Table 2 indicates the size of treatments used from September 1950 through September 1951. The amount of gel fluid used has varied from 750 to 8,000 gal. per treatment. The first treatments were performed using a 1,500-gal. or double batch treatment. The first change in the size of treatment was to increase this amount to 2,250 gal. It can be readily seen that the size of treatment has steadily been increased and that at the present time there are three more common-sized treatments used: (1) The 1,500-gal. treatment is most often used in connection with the straddle-type packer, (2) the 3,000 and 4,500-gal. treatments are commonly used with both the casing and anchor-type packer. Note that a few 750-gal. treatments have been used. Apparently these treatments generally were not satisfactory since none have been performed in the last 3 months.

The second change with regard to size of treatment and materials used was to increase the amount of sand

TABLE 2—SIZE OF HYDRAFRAC TREATMENT

	Amount of gel fluid, gallons									Total No treatments
1950—	750	1,500	2,250	3,000	3,750	4,500	5,250	6,000	8,000	
September		3								3
October										0
November		2	1							3
December		17	14							31
1951—										
January	1	62	16							79
February		41	7	6						54
March	5	57	4	16				1		83
April	3	57	7	30	2	1				100
May		63	6	27	1	4	1	3		105
June	2	61	9	26	1	13		2		114
July		56	15	41	1	26		5		144
August		78	17	32	1	34	5	4	1	172
September		60	19	40	1	33		5		158
Total	11	557	115	218	7	111	6	20	1	1,046

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- Can be completely lubricated with pressure gun while in operation.
- Friction co-efficient of packing material lowest compatible with use.
- Rotation friction divided between two elements—*effective packing speeds reduced*, wear reduced, life prolonged.
- Packing assembly fast and easy to replace—fits either way, goes in without disconnection of gooseneck or hose.
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per batch from 400 lb. to either 600 or 800 lb. During June 1951, the amount of sand used averaged about 500 lb. per batch for all treatments.

The next change was the reduction of breaker fluid. Satisfactory results have been obtained by reducing the volume of breaker fluid used by half. Another technique has been to displace the gel only into the formation with crude oil mixed with breaker chemicals. Finally, some treatments have been performed without the use of any breaker fluid.

Treating Pressures and Injection Rates

Treating pressures are generally below that normally expected for the depth of formation being treated. This may be explained since much of the Spraberry section contains natural fractures.

Oil generally may be pumped into the formation prior to Hydrafrac treatment at pressures from 600 to 1,800 psi.; average is about 1,000 psi. In one case, 3,100 psi. was required for breakdown with oil. Maximum treating pressures generally range from 1,500 to 3,500 psi.; average is about 2,500 psi. These figures are for 2-in. tubing. Larger tubing or drill-pipe sizes will reduce the friction loss and lower surface-treating pressures will be observed. Generally higher treating pressures are observed when treating through casing perforations. Maximums of 5,500 to 6,000 psi. have been encountered.

Recording pressure devices have been run down the hole on open-hole treatments both below packers and with no packer in the hole. Although only a limited number have been run, the following features have been indicated.

1. Due to the viscosity of the gel, surface pressures are not a reliable reflection of pressures existing down the hole. The smaller the tubing, the more pronounced is this feature.

2. Oil squeeze, at injection rates of 3 to 5 bbl. per minute, generally increases bottom-hole pressure 400 to 1,200 psi. above hydrostatic oil load pressure.

3. Pumping gel at the same rates into the formation increases the bottom-hole pressure from 100 to 500 psi. above that obtained with the oil squeeze.

4. By increasing injection rate to 10 to 15 bbl. per minute, the bottom-hole pressures remain about the same as when injection rate is 3 to 5 bbl. per minute.

Initial production from wells treated down the annulus with high injection rates have not indicated that this results in a better treatment.

Re-Treatments

Re-treatments have been of two general types. First, zones have been re-treated a few days after initial treatment. The second treatment usually has consisted of a larger volume than the first. In a few cases, the second treatment has increased production sufficiently over that obtained from the initial treatment to result in a commercial well.

The second type of re-treatment is that performed on wells which were completed as commercial wells after the original treatment. If, after producing several months, these wells no longer are capable of making their allowable production, re-treatment with increased volumes of gel fluid has been successful. However, evaluation of this type of treatment is not complete.

Theory of Treatment

The Hydrafrac treatment has been proven as a method of stimulating oil production from the Spraberry section. Why and how does it work? An answer to this question should result in better well completions.

Pumping crude oil, or kerosine, has been tried without commercial success in the Spraberry. What is the difference between the Hydrafrac treatment and an oil squeeze? Primarily, Hydrafrac gel fluids have very high viscosity which enables the suspending and pumping into the formation of a specially graded sand. As a result of these differences, several proposals may be made as to what happens to the formation as a result of a Hydrafrac treatment.

First, the existing fractures may be further opened and held apart by the sand grains introduced into the formation in the gel fluid.

Second, the existing fractures may be extended and both original and extended fractures held apart by the propping agent.

Third, the existing fractures and extensions may be enlarged due to the abrasive action of the propping agent introduced in the gel fluids at high velocity.

Fourth, due to the peculiar nature of vertical and parallel fracturing, transverse breakage may occur from fracture to fracture due to the bending applied to these layers in the vicinity of the bore hole. The high-viscosity, low-fluid-loss characteristics, and sand may all be factors which allow the necessary bending force to be applied to these layers.

Air-Drilling Operations

by O. H. Berry and Bill Quesenbury, Jr,
Wilshire Oil Co., Inc., Midland, Tex.

This paper reports factual data relative to the mechanics of two experimental air-drilling operations conducted by Penntex Oil Corp. and Wilshire Oil Co., Inc., in Martin and Upton counties, Texas. The authors relate the manner in which the foregoing operations were performed, the problems associated therewith, and the progress to date.

Air drilling in itself is not considered by the authors to be the optimum means of completing a well in the Spraberry sands. Their efforts in this connection are with the view of attempting to formulate and evaluate a completion technique which may afford the advantages of cable-tool drilling at rotary rates of penetration. Moreover, they hold air circulation may prove applicable in overcoming lost-circulation problems and in the coring of depleted and semidepleted reservoirs in conjunction with secondary-recovery studies. Results to date suggest the mechanical practicability of air as a circulating fluid, and in time they hope to have at least a partial answer as to the merits of this completion practice.

FIRST of the air experiments under discussion was conducted on an exploratory well, Penntex Oil Corp.'s 1 Ragland in Martin County, and resulted in drilling 922 ft. of Spraberry formation which proved barren after stimulative measures were performed.

The second experiment is now in progress at a North Pembrook development well, Wilshire Oil Co.'s 5-21 Hunt in Upton County. This latter experiment is currently upheld pending a fishing job, having successfully drilled 108 ft. of formation below the oil string. Incidentally, there is a 4,400-ft. oil column in this hole and during drilling operations, oil was continuously jetted at the rate of approximately 10 bbl. per hour from 7,185 ft. to the present depth of 7,198 ft.

Initiation of these experiments stemmed from the experiences of Wilshire in overcoming severe lost circulation by aerating drilling fluid. The excellent results obtained through circulation of natural gas in the San Juan basin of New Mexico further encouraged this undertaking.

Equipment

Consideration was given to circulation of natural gas, L.P.G., and air prior to commencing this work. The

latter was selected inasmuch as no large natural-gas supply was available nearby and the facilities for handling large volumes of L.P.G. were unobtainable. Through improvision, air-compressing equipment was assembled which was rated to deliver 1,000,000 to 1,500,000 cu. ft. per day at a maximum pressure of 600 psig. At the Martin County operation this equipment consisted of 10 small two-stage compressors commonly used in construction work, and three larger single-stage booster compressors normally used for compressing natural gas in acidization work.

Essentially the same hookup is being used in Upton County with the exception that three 500-cu. ft. per minute two-stage compressors have supplanted the 10 smaller compressors. This equipment was tied into a series of manifolds and an aftercooler, as indicated in Fig. 1. During normal drilling operations delivery averaged 900 M.c.f. per day at approximately 200 psig. and 150° F. For future work Wilshire has on order one 200-b.hp. two-stage compressor which is sized to deliver 1¼ M.M.c.f. per day at 380 psig. discharge. Availability influenced the selection of this particular piece of equipment, however.

Surface-pressure-control equipment on both jobs consisted of a manually controlled master valve, two hydraulically controlled blowout preventers (one equipped with blank rams), one hydraulically controlled flow-line valve, and a rotating stripper head. Subsurface-pressure-control equipment was incorporated in the Upton County drilling string. This, although no need has developed as yet, affords a means of plugging the drilling string for purposes of making a connection or a trip if the well should commence to flow naturally. An Otis type "J" landing nipple was run in the lower portion of the string, whereas, a plugged modified type "J" mandril could be lubricated and seated for a shutoff.

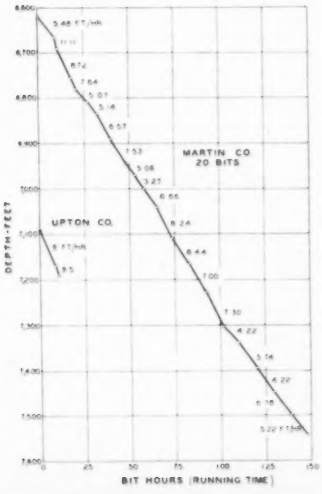

Fig. 1—Air-drilling penetration rates in Upton County, Texas.

The oil string was cemented in a supposedly impervious zone overlying the fracturing at the top of the first Spraberry sand in both wells. At the Martin County well, the hole was jetted completely dry and the first 48 ft. of formation below 7-in. casing at 6,620 ft. was drilled by conventional circulation of air through a 6⅛-in. Hughes W7R rock bit with a reduced water course on 3½-in. drill pipe. A penetration rate of 5½ ft. per hour was obtained applying only 4,000 to 6,000 lb. of weight and rotating 35 to 40 r.p.m. Returns at the surface, however, were in the form of dust and cuttings, and were valueless from the standpoint of geologic analysis. It also appeared that the hole was not being properly cleaned since, when pulling the bit, considerable drag was noted.

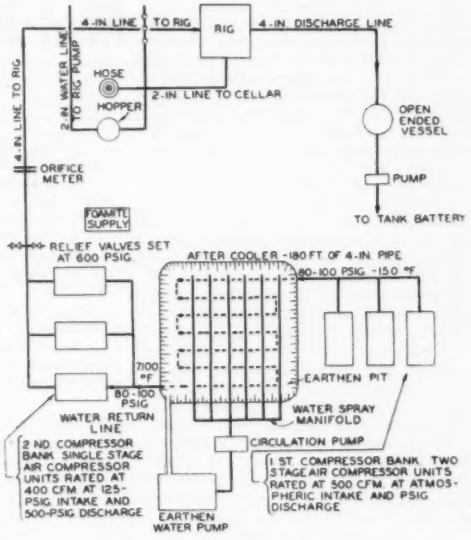
4-IN LINE
TO RIG
RIG
4-IN DISCHARGE LINE
4-IN LINE TO RIG
2-IN WATER LINE TO RIG PUMP
HOSE
HOPPER
2-IN LINE TO CELLAR
OPEN ENDED VESSEL
ORIFICE METER
PUMP
TO TANK BATTERY
FOAMITE SUPPLY
RELIEF VALVES SET AT 600 PSIG
AFTER COOLER - 180 FT OF 4-IN PIPE
80-100 PSIG - 150 °F
7100 °F
80-100 PSIG
EARTHEN PIT
WATER SPRAY MANIFOLD
WATER RETURN LINE
CIRCULATION PUMP
2 ND. COMPRESSOR BANK SINGLE STAGE AIR COMPRESSOR UNITS RATED AT 400 CFM AT 125-PSIG INTAKE AND 500-PSIG DISCHARGE
1 ST. COMPRESSOR BANK TWO STAGE AIR COMPRESSOR UNITS RATED AT 500 CFM AT ATMOSPHERIC INTAKE AND PSIG DISCHARGE
EARTHEN WATER PUMP

Fig. 2—Air-drilling flow diagram.

Reverse Circulation of Air

Following Hydrafracing of the upper Spraberry, a conventional 6⅛-in. Hughes OWS bit was run and drilling was resumed using reverse circulation of air through 3½-in. drill pipe. This proved very satisfactory in maintaining a clean hole and the recovery of formation samples suitable for examination. Drilling in this manner progressed to a total depth of 7,542 ft.

It may be of interest to point out that air circulation proved particularly conducive to cleaning out after shooting in this well. A 100-ft. interval was cleaned out following a selective shot of 100 qt. in 6½ hours. Surprisingly large particles of the bomb and shell case were lifted by reverse circulation together with formation fragments and shot gravel.

At the Upton County job, 81 ft. of formation below the oil string was drilled in 9 hours for a penetration rate of 9 ft. per hour using reverse circulation. A string of 2½-in. tubing with two 4½-in. drill collars was rotated 50-60 r.p.m. carrying 10,000 lb. on a 5⅝-in. Hughes OWS bit. The average surface air pressure was 250 psi. and volume rate was approximately 1 M.M.c.f. per day. The bit was pulled after 81 ft. for inspection and found to be in fairly good condition. No abnormal wear appeared to have occurred in the bearings as one would expect. The second bit of this type cut 19 ft. in 2 hours before plugging at a depth of 7,190 ft. Upon pulling this bit, two stands of oil were recovered and undoubtedly the plugged bit and bottom drill collar resulted from this initial fluid.

Top of the first Spraberry sand was encountered at 7,148 ft. (—4,417) by sample correlation, but no odor of gas or oil staining was noted until a depth of 7,185 ft. was reached. A Hughes OWS and Reed 2C bit were run, but became plugged before any hole could be cut. A skirted Hughes W7R was then run and cut 8 ft. of hole in 2 hours at which time the tubing twisted off at a depth of 5,750 ft. Fishing is now in progress.

In drilling the shale sections below the casing seat and above the Spraberry sand top in both wells, a small amount of drilling mud was detected in our air discharge. This fluid could have possibly leaked from behind the oil string, or could have resulted from vertical fracturing through the casing seat.

Some of the Problems

In weighing the different problems encountered in these operations, the plugging tendency of the drill collars and the bit at the Upton County job

has been our greatest concern. No difficulty was experienced with circulation in drilling from the casing shoe at 7,090 ft. to a depth of approximately 7,185 ft. where oil was first noted in the flow lines. The tubing did not plug, nor did it contain any adhering particles; however, on two occasions, after reaming to bottom, the bottom drill collar and bit were plugged. In an effort to alleviate this condition a skirted Hughes W7R rock bit was run. It was hoped that the skirted rock bit would force all particles through the bit cones thus reducing the size of the cuttings and eliminating the plugging condition. It is impossible to determine the exact benefits of this skirted bit due to the twistoff.

No plugging of this type was noted at the Martin County well. However, the tubing was plugged on several occasions due to an accumulation of particles up and down the tubing string. Only a very small amount of fluid entered this well while entrance of fluid into the Upton County well was at a rate of 10 bbl. of oil per hour.

Unloading the Hole

The laborious and time-consuming task of unloading the hole of fluid has been solved by the introduction of three Garrett type "O" pressure flow valves in the drill string at depths of 5,000, 5,900, and 6,600 ft. These valves, set at opening pressures of 550, 525, and 515 psi. respectively, have unloaded a 2,100-ft. oil column from a total depth of 7,200 ft. in 3 hours following a trip.

The education of the drilling-crew personnel to the problems encountered with air as a circulating medium has been a minor problem. Operation of various valves and the bleeding off of large volumes of air at high pressures required close supervision until the crews had become indoctrinated. No injuries have occurred to date.

The question usually arises as to the hazards involved in drilling with air. Before operations were commenced, an insurance company was consulted as to coverage of the rig insofar as increased risks were concerned. The use of air was of no greater danger, in their opinion, than the use of oil. Probably the only real danger lies in the discharged oil spray. To lessen this fire hazard, floodlights have been mounted around the rig at distances of 100 ft., allowing all rig lights to be extinguished, and the well effluent is directed to an open vessel approximately 500 ft. away from the rig.

It is believed that the results obtained to date using an empirical approach and trial-and-error means at the well site are sufficiently encouraging to justify further investigation of air circulation as an aid in completion practice.

Mud Programs

by W. S. Howe
Permian Mud Service, Inc., Midland, Tex.

There are certain mechanical means to cut mud losses which are important in Spraberry drilling:

1. Where lost circulation is acute, mud volumes being pumped should be as low as is practical to reduce pressure on the annulus, but the annular return velocity should be kept high enough to clean the hole.

2. The use of drill-pipe floats to reduce the piston action of the pipe when going in the hole should be discouraged.

3. Rapid lowering of the pipe while going in the hole should be avoided to reduce pressure surges against the formation.

4. "Spudding" is to be avoided, again to reduce pressure surges in the hole.

In conclusion, the main problem in Spraberry drilling mud control is to keep the drilling fluid as light as practical where zones of weakness are known to exist.

THE Spraberry trend is such a large area that few, if any, positive statements can be made concerning mud programs which will apply to all wells drilled in the region. The greatest concentration of drilling has been in Midland, Upton, Reagan, and Glasscock counties, and it is with this area that this paper deals.

Geological Considerations

There are certain geologic features which are the basis for casing programs used in this area, and thus affect the mud program to be followed. Below the surface sands and shales are the Permian red beds and at about the base of the red beds and above the Rustler anhydrite the main salt section is found.

Depth to the Rustler varies from about 1,600 to 1,700 ft. on the west side of the present active area to about 600 ft. on the east side. Between the Rustler and the first solid Permian lime is the main salt and anhydrite section. Depth to the lime also decreases from west to east, being about 4,000 ft. on the west, decreasing to about 2,200 ft. on the extreme east side of the present active area.

Lost-Circulation Problem

From the top of the Permian lime to the top of the Spraberry sand are found limestone, shales, and sands, all of Permian age, and it is in this section of the hole that the most difficult Spraberry mud problem is encountered, which is lost circulation. A general trend is being noted in the four-county area with lost circulation.

In the south, through Pembrook and Benedum fields and apparently along the east side of Reagan and Glasscock counties, loss of circulation is not too much of a problem. Along a northeast-southwest trend through the west side of Tex-Harvey field and extending into the Driver area immediately below, lost circulation is generally a much more serious problem. Zones of loss of circulation in this area are generally about 4,300, 5,500, and 6,500 ft. with the most serious losses frequently occurring at 4,300 ft.

Basically the Spraberry mud program consists of maintaining as light a mud as possible to minimize lost circulation with minimum control of viscosity and filtration rate as determined by hole condition.

The casing program being used determines the mud program to be followed. Two basic programs have been used, the earliest, and still the most satisfactory from a mud-control standpoint, consisting of a relatively short surface string to protect the fresh water sands, a salt string set into the top of the solid lime, and an oil string generally set above the top of the Spraberry. With this program there is not much need of a definite mud program as a natural salt-water mud can be used to set the salt string.

Fresh water can be used below the salt string and frequently the production string may be set without addition of any mud materials. At times trouble is experienced with fresh water alone from caving shale and bridged hole. In cases such as this, a mud with the following characteristics is generally adequate:

Viscosity: 60 seconds A.P.I.
Weight: 8.7 to 8.8 lb. per gallon.
Filtration rate: 10 to 20 cc.

In certain areas, even with fresh-water muds, lost circulation is troublesome and it may be desirable to reduce weight to as low as 8.3 lb. per gallon. Addition of oil to reduce weight coupled with addition of 2 to 3 lb. per barrel of fibrous material is generally adequate, although in isolated cases heavier concentrations of sealing material are necessary.

When drilling with fresh water, and it is not desired to go to a mud system loaded with fibrous materials, troublesome lost-circulation zones have frequently been plugged off with fibers and gel-forming mixtures.

One technique that has been successful has been to use a combination of leather and fibers with two to three sacks of each run ahead and behind a 5 to 10-bbl. slug of oil-base mud, which will thicken in the presence of fresh water. This practice often proves valuable in cutting down the loss of water or eliminating it altogether.

In drilling without a salt string, mud control is no particular problem to a depth of about 4,000 ft. and just a natural salt-water mud with some water thinning is used. Where the 4,300-ft. lost-circulation zone is generally present, it is thought to be good practice to mud up about 4,000 ft. The pits should be thoroughly cleaned to remove as much of the red-bed solids as possible and the mud volume rebuilt with fresh water or with clear salt water from the reserve pit.

The desirable mud properties to about 5,000 ft. are as follows:

Viscosity: 36 to 38 seconds.
Weight: 9.0 lb. per gallon or less.
Filtration: 50 to 60 cc.

A mud of these characteristics can generally be obtained by adding salt-water clays to obtain a viscosity of 31 to 32 seconds, prior to adding oil and 10 to 15 lb. per barrel of lost-circulation materials. Initial addition of about 20 per cent crude oil is generally desirable and will usually reduce the weight to about 9.0 lb. per gallon. This mud is actually a water-oil mixture, and at present there is some experimenting going on with the use of emulsifying agents in an effort to obtain a true water-oil emulsion in a hope that mud weight can be reduced even further with a usable viscosity and gel strengths.

Below 5,000 ft., the viscosity should generally be increased to 40-45 seconds to maintain a clean hole and the weight kept as low as possible with the regular addition of oil. Pits should be cleaned frequently to reduce the mud solids which tend to increase weight and often cause rapid increase in viscosity. Regular addition of fibrous material and hulls should be maintained with the heavy concentration of lost-circulation material it is not possible to use a shale shaker, and in order to reduce solids to a minimum it is frequently beneficial to circulate through the reserve pit in order to have a greater circulating area and reduced circulating velocity to permit the solids to settle out.

From about 6,500 ft. to the production casing seat, it is generally good practice to reduce filtration rate to about 20 cc. by addition of starch. Prior to running the oil string it is often advisable to increase the viscosity to above 50 seconds.

The above outline is of a rather general nature; but is applicable in part to nearly all Spraberry drilling. There are, however, certain problems of extreme lost circulation which should be discussed.

In the northeast-southwest diagonal of Tex-Harvey field mentioned above, a zone of extreme lost circulation can be traced. This zone seems to be in the San Andres formation and often grows progressively worse as drilling proceeds. The lightest weight possible is necessary and heavy slugs of sealing material (20-30 lb. per barrel) in approximately 300 bbl. of mud should be spotted opposite this zone in an attempt to gain circulation. The combination generally recommended is 20 lb. of fibrous materials with 5 to 10 lb. of hulls per barrel. Some operators prefer cellophane flakes but from a cost standpoint it appears that the cheaper fibrous materials and hulls are more desirable. Raw bentonite has been added at the pump suction to an extremely thick gel slurry heavily laden with sealing material, pumped down and spotted opposite the porous zone. If circulation is not regained shortly by this method, immediate cementing should be done to reduce erosion.

In any case of complete loss of returns, it is considered good practice to spot a slug of mud loaded with sealing materials on bottom, pull up 10 or 15 stands, and try to regain circulation at this point. If, after 100 to 150 bbl. of mud is pumped in, no returns are obtained, pull out of the hole and fill up from the surface, let the hole stand awhile, and go back in the hole breaking circulation every few stands in an attempt to maintain circulation. Oil should be added to lower the weight if possible.

Sealing or lost-circulation materials are numerous. It appears that a combination of fibrous materials, which gives a wide variation in particle size, is the best and cheapest combination to carry as a permanent addition to either fresh or salt-water muds. Where systems are fairly well loaded with fibrous materials and there still exists a slight loss of fluid, the addition of coarse mica or gound wood bark seems to be beneficial.

One operator has had good results by the addition of ½ to 1 lb. per barrel of treated leather. The test results on this material shows that it forms a good matting base against a porous zone, and when used with fibrous material, actually shows good resistance to water flow.

Due to the high initial weight of salt-water muds, the foaming which is characteristic of such muds is slightly beneficial in reducing effective mud weight, provided of course, that it does not interfere with pumping. Should this latter trouble develop, foaming may be reduced by the use of antifoaming agents.

S.E.G. ABSTRACTS

Papers presented at the fifth annual midwestern meeting of the Society of Exploration Geologists, Dallas, November 19-20. Sponsored by the Geophysical Society of Tulsa.

Geophysical History of the Golden Trend of Oklahoma

JOHN R. HILL, Carter Oil Co., Oklahoma City.

UNTIL the discovery of oil in the Deese (Pennsylvanian) formation in the Globe-Vickers 1 Gibson, SE NE 30-3n-2w, in February 1946, exploration for oil west of the Nemaha ridge in Oklahoma had been directed primarily toward location of simple anticlines and fault closures. Discovery of Deese oil in an area which had been thoroughly detailed by seismograph throughout a period of more than 10 years, and which had showed no structural folding from reliable seismic data, immediately indicated the possibility for widespread stratigraphically trapped oil.

Maps, both new and old, were studied in a new light. Isopachous maps were constructed from seismograph data which reflected the Deese pinchout. All wells throughout the province were carefully checked for Deese sand thicknesses and shows of oil and water. The seismic maps, particularly the isopachs, were coordinated with these Deese sand studies and a resultant outline drawn which was believed to encompass the Deese oil possibilities. The result is considered a good example of the benefits of closely coordinating geology and geophysics.

The recommended outlines based on the wedgeout of the Deese from seismic cross-sections and isopachous maps, although insufficient in many places and too extensive in others, served as a substantial guide for acquiring productive acreage.

Geology of the Williston Basin

W. M. LAIRD, North Dakota Geological Survey, Grand Forks, N. D.

THE Williston basin covers about two-thirds of North Dakota, overlapping into South Dakota, Montana, Manitoba, and Saskatchewan. In North Dakota about 14,000 ft. of sediments have been deposited in the deepest part of the basin. Of these sediments, about 10,000 ft. can be considered to contain potential oil-bearing strata. Discoveries of oil and gas have been made in two horizons of the Devonian and one horizon in the Mississippian. In all, 37 wells have been drilled or are drilling in search of oil or gas. In addition to these, there are 27 wells which have been drilled for shallow gas mostly in the Eagle sand of the Pierre shale in the southwestern part of the state.

Rocks of all systems of the Paleozoic are apparently present although rocks of the Pennsylvanian and Permian are found only in the southwestern part of the state. All periods of the Mesozoic are present but of the Cenozoic only the Paleocene, Eocene, and Oligocene and Pleistocene are recognized.

The general structural outline of the basin can be shown by contours on the Dakota sandstone. It should be noted that this basin has been progressively sinking throughout geologic time. Within the confines of the basin are a number of known folds, the largest of which is the Nesson anticline. The origin of these folds is unknown. Some probably owe their origin to orogenic forces, but some smaller folds may be due to compaction.

The most important exploration method now being used is the seismograph although other geophysical instruments and surface geology are not being neglected. More drilling is needed to evaluate which exploratory tool or tools are best. Probably it will be found that all tools must be used together.

Continuous Velocity Logging

G. C. SUMMERS and R. A. BRODING, Magnolia Petroleum Co., Dallas.

A METHOD for obtaining a continuous well log of formation acoustic compressional velocity is described. The instrument is composed of an acoustic pulse generator separated from a receiver by a 5-ft. acoustic insulator. Means are provided for generating an acoustic pulse and automatically selecting and recording the first break travel time as detected by the receiver. The instrument has a range of 5,000 to 25,000 ft. per second and an accuracy better than 5 per cent. The log is taken in a conventional well-logging manner at speeds of 100 to 150 ft. per minute. In addition to the travel time the amplitiude of the received pulse is also recorded.

Typical logs are illustrated along with their correlation to seismic reflection horizons and lithology in the borehole.

Exploring for Pennsylvanian Reefs in the Permian Basin With the Reflection Seismograph

SIDON HARRIS, Southern Geophysical Co., Inc., Fort Worth.

GENERAL remarks concerning the use of the reflection seismograph in locating Pennsylvanian reef deposits in the pre-Permian section of the Permian basin are made with some illustrations, including seismograms and cross-sections. Special consideration is given to Wellman field of southern Terry County discovered in 1950 by Anderson-Prichard Oil Corp. Several important steps or necessary criteria are listed with reference to the detection and recognition of possible Pennsylvanian reef buildups.

Attenuation of Radio Frequency Waves Through the Earth

W. C. PRITCHETT, Atlantic Refining Co., Dallas.

EVIDENCE has been presented by several investigators indicating the possibility that radio waves penetrate sufficiently deep into the earth to be useful in prospecting for oil.

Conventional electromagnetic theory used with normal values of the earth constants indicates, however, that the attenuation is too great to allow the signal to be used after propagation through significant distances of shale.

To settle the above question an experiment was conceived and carried out in which the signal level in the earth was measured at various distances from a battery-operated transmitter operating at 1,652 kilocycles suspended in an uncased, mud-filled hole by a mud-saturated rope. The mud resistivity was matched to that of the 40-ft.-thick shale section used in order that the entire immediate region would be as nearly as possible homogeneous. The receiver was also battery operated and suspended by a cable in other similar mud-filled holes at various distances from the first hole.

The attenuation constant in shale was found to be .18 nepers per foot (1.56 db per foot), which is much too large to give any hope of deep penetration. A few measurements in a limestone section gave a value of .086 nepers per foot, which is also too large to be useful. Although these values are quite high, they are lower than theory predicts for these earth resistivities by a factor of about three.

Geophysical Exploration in the San Juan Basin

NEAL CLAYTON, Century Geophysical Corp., Tulsa.

A GENERAL discussion of the problems encountered in making geophysical surveys in the San Juan basin. Magnetometer and gravity surveys are complicated by the extreme topographic relief and the presence of Tertiary intrusives. Seismic surveys are hindered by the scarcity of water for drilling. Housing for all geophysical crews is a major problem. Adequate velocity and well control are lacking in most parts of the basin.

Near-Surface Seismic Waves In a Part of the Edwards Plateau, Texas

THOMAS C. POULTER and LEONARD V. LOMBARDI, Stanford Research Institute, Stanford, Calif.

EXTRANEOUS energies, frequently repetitive and sufficiently strong to mask completely any reflections, appeared very prominently on a set of seismic records obtained in Crockett County, Texas. These energies consist of several cycles showing large stepouts, and are presumably the results of horizontally traveling near-surface waves.

In an attempt to discover the source of these energies, a group of records was obtained with varied shot point offsets and recording spread orientations. The evidence deduced from analysis of these records, and means of reducing the effects of the disturbances are discussed.

Seismic Velocity Logging

W. D. MOUNCE, C. L. HUBBARD, C. J. CHARSKE and H. P. KUPPERS, Humble Oil & Refining Co., Houston.

AN instrument containing a sound source and a pair of receivers is described which measure the time required for a pulse to travel vertically 1 ft. through the earth. These travel times are recorded at the surface at a rate of about 10 per second as the instrument is moved continuously through a bore hole. Examples of logs made in several different geologic provinces are given, and comparisons with other logs and with cores are shown.

Geology of the Permian Salt In the Western Anadarko Basin, Kansas-Oklahoma

D. F. MOORE, Stanolind Oil & Gas Co., Wichita.

COINCIDENT with abrupt and rather large seismic velocity changes in parts of the Western Anadarko basin is the presence of two distinct Permian salt basins. The margins of these basins have been fairly well defined. Major salt development occurs immediately below the Blaine and indicates as much as 350 ft. of divergence in the Blaine-Cimarron interval. Present topographic expressions indicate that percolating ground waters and subsequent solution phenomena have been active since at least late Pliocene time.

Primarily, this paper will discuss the Permian stratigraphy as related to the seis-

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mologists' problem; relative structural movements; theory of salt origin and removal thereof by solution - collapse phenomena.

Relation of Seismic Corrections To Surface Geology

H. M. THRALLS and R. W. MOSSMAN, Seismograph Service Corp., Tulsa.

THE arbitrary application of any set type of near-surface corrections to seismic data can lead to erroneous results. The determination of the type of correction to be used must be based, in part, on the type of formations present in the near-surface. Case studies are offered to illustrate various conditions, including use of "floating" elevation reference planes as compared to a constant datum or a base-of-shot reference.

Seismic Exploration of the Denver-Julesburg Basin

B. F. RUMMERFIELD, Century Geophysical Corp., Tulsa.

RECENT developments in northeastern Colorado and southwestern Nebraska have resulted in a marked increase in seismic activity within the Denver-Julesburg basin.

The low relief of many of the subsurface structures, coupled with the extraneous effects of weathered zone, elevation changes, surface deposits and velocity variations taxes the resolving power of the seismic method and the interpretive ability of the geophysicist.

Salt Solution, a Seismic Velocity Problem in Western Anadarko Basin, Kansas-Oklahoma-Texas

M. B. WIDESS, Stanolind Oil & Gas Co., Tulsa.

SOLUTION of salt from a shallow upper Permian formation in parts of Western Anadarko basin was observed to produce a profound and relatively abrupt velocity change, such as to cause over 300 ft. of seismic relief error across a distance of less than 3 miles. Core-hole velocity shooting and velocity profiling were used in the study of the effect of salt solution. The theory, methods, and results of the velocity profiling program are described. The core-hole velocity data are analyzed relative to shallow velocity zones, the evidence suggesting that the velocity has been altered by more than one stage of ground water activity.

The Development of a New Method of Seismic Velocity Determination

F. P. KOKESH, Schlumberger Well Surveying Corp., Jackson, Miss.

CONSIDERABLE interest has recently been aroused in a new method for measuring seismic velocities wherein the explosive charge is placed in the hole and the seismic energy is picked up with detectors placed on the surface. Experimentation carried on during the past year indicates that the new method is quite workable.

This paper attempts to outline the basic problem of velocities and their measurement and describes the preliminary development that has been done thus far on the new method of velocity measurement.

Deep-Well Pressure Geophone

THOMAS BARDEEN, Gulf Research & Development Co., Pittsburgh.

A NEW-TYPE pressure - equalized deep-well geophone which responds to changes in pressure has been developed and tested. A rigid chamber containing a fluid considerably more compressible than the well fluid is elastically connected to the well fluid by a flexible diaphragm. A description of the detector is given. Results of field tests comparing this geophone with conventional geophones are shown. The pressure-type geophone gives sharper arrivals and has a better signal-to-noise ratio so that less explosive is needed.

Up-Hole Times

J. P. WOODS, Atlantic Refining Co., Dallas.

THE up-hole travel time for the seismic impulse from a dynamite explosion is usually taken to depend only on charge depth and formation velocity. In practice, this travel time is influenced by charge size, by filter setting, by instrument sensitivity, and by previous history of the shot hole. In some areas, there occur anomalous up-hole times which are difficult to explain.

Sandusky Fields, Grayson County, North Texas

(Continued from page 61)

separated by a major fault (later proved), and the structure was found to lie farther south and west.

Meanwhile, The Texas Co. brought in Sandusky's first producer, a 106-bbl. well in the Ellenburger at 7,848-84 ft., and the Texas Railroad Commission designated it as the discovery of Sandusky-Ellenburger pool. Location was southeast of Sandusky in the Tuttle Survey.

One major company, apparently still holding to original seismic computations, completed its second well in February 1951, in the southwest corner of the Armstrong Survey, northwest of Sandusky. The Oil Creek was present at minus 7,545 ft. It was dry at 8,280 ft., total depth. The company then farmed out its remaining holdings in the area to McMillan.

Oil Creek discovery.—After reworking the area and on the basis of a new position on the subsurface structure, McMillan drilled his 1 Chambers in the northeast corner of the Fisher Survey. This location was calculated to be south of the east-west fault line, and also about on top of the structure. It had the Oil Creek at minus 6,434 ft. and completed in July 1950 for 396 bbl. of oil a day. The Railroad Commission designated it as the opener of Sandusky-Oil Creek field.

Development and exploration.—Further drilling brought in two small Pennsylvanian producers near the Oil Creek discovery and established a southeast trend to the general area. Many wells were long stepouts to nearest production.

Additional Ellenburger oil was found in the south half of the McLeod Survey, where local erosion had eliminated the Oil Creek sand. Magnolia Petroleum Co. completed three good wells in which the Oil Creek was missing.

Fault line proved.—Returning to development on the northwest end of the field, McMillan continued working on his theory of the structure being on both sides of the fault. Location for his 1 Rich was two locations directly east of the dry hole in the Armstrong Survey. Saturated sand was found between 8,209-37 ft., and the well completed in April 1951 for 415 bbl. of oil a day. The commission designated this well the opener of McMillan-Oil Creek field. At this time an east offset has been completed from 27 ft. of pay for 385 bbl. of oil, and a south offset was drilling.

Reserves and outlook.—At this writing, 7 Ellenburger, 2 Pennsylvanian, and 25 Oil Creek sand wells have been completed in Sandusky and McMillan fields. Average sand thickness in the Oil Creek wells is around 40 ft. and recovery has been estimated at 500-700 bbl. per acre-foot, or an average of 30,000 bbl. per acre. Drilling to date on 40-acre spacing has given the Oil Creek producers 1,000 acres proved and a 30,000,000-bbl. pool. Estimates were not available on the Ellenburger reservoir.

While the two Pennsylvanian wells in the field had commercial production, the first major well in that formation was recently completed by Mid-Continent Petroleum Corp. as its 1 Martin. Location in the Walker Survey is considerably south of the developed area and it may be the start of still another field. Completion potential was 252 bbl. of oil a day from pay at 6,912-93 ft.

Big Mineral Creek field, on the extreme southeast end of the present trend, William Allen Survey, will make an interesting chapter of its own. Formation faults in that area have plunged the Oil Creek sand down to 10,245 ft., minus 9,545 ft., or some 3,000 ft. lower than in the Sandusky fields.

George W. Humphrey 1 Barnes Heirs found discovery production in a Pennsylvanian sand around 3,600 ft., and to date six wells have been completed from the shallow pay. A second well and close offset to the 1 Barnes was drilled and completed as the Pennsylvanian discovery for the area, and the first test was continued to explore the lower formations.

When the 1 Barnes entered the Oil Creek sand, after finding top of the Simpson at 8,518 ft., minus 7,818 ft., it found commercial production but the oil was around 62° gravity and gas-oil ratio was high. Due to lack of immediate outlet for the gas the 1 Barnes has been plugged back to finish in the Pennsylvanian, and further development of the deep pay zone will be delayed.

The 1 Barnes had oil-cut mud on tests immediately below the Pennsylvanian, and also in the Hunton limestone which was topped at 7,575 ft. Drill-stem tests in the Oil Creek developed distillate from 10,244-89 ft., and drilling indicated sand with oil shows to 10,314 ft. Production tests through perforations at 10,293-10,310

ft. gaged 2,500,000 cu. ft. of gas a day through ½-in. choke, plus 139 bbl. of distillate. The well was then plugged back from 10,343 ft., total depth, to 5,460 ft.

Operators in the Sandusky fields are optimistic when discussing the future. Ordovician production, above the Ellenburger, has been limited to the Oil Creek sand, the only Simpson member present in wells drilled so far. There is a strong possibility, they believe, of finding structures to the south, or on the southeast trend that will include the rest of the Simpson family. These are the Bromide, Tulip Creek, and McLish, all good producing zones farther up on the northwest trend into southwestern Oklahoma (Golden Trend area), and also in the many Permian basin fields.

Porosity Index in Limestone

(Continued from page 66)

3. **6¾-In. Hole; Limit = 238 R_m; d = 5.85 In.; AO/d = 5.5**

R_t/R_m	$p_x = (R_m/R_t)^{1/2}$	R_s/R_m	"Per cent deflection" $238-R_s/R_m$
			238
1,110	3	177	25.6
625	4	160	32.8
278	6	131	44.9
156	8	108	54.6
100	10	90	62.1
69.5	12	73	69.3
52	14	62	74.0
39	16	52	78.0
31	18	43	82.0
25	20	36	84.8
16	25	23	90.3
11	30	15	93.7

4. **4¾-In. Hole; Limit = 720 R_m; d = 3.37 In.; AO/d = 9.5**

R_t/R_m	$p_x = (R_m/R_t)^{1/2}$	R_s/R_m	"Per cent deflection" $720-R_s/R_m$
			720
1,110	3	445	39.2
625	4	362	49.7
278	6	263	63.5
156	8	198	73.5
100	10	153	78.8
69.5	12	114	84.2
52	14	83	88.6
39	16	68	90.6
31	18	49	93.2
25	20	38.5	94.6
16	25	23	96.8
11	30	14.5	98.0

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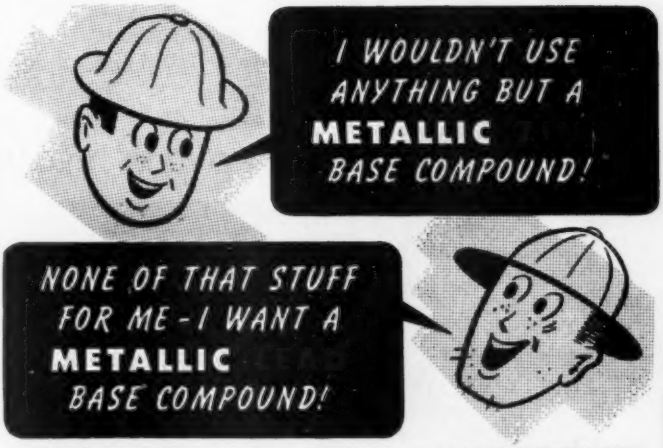

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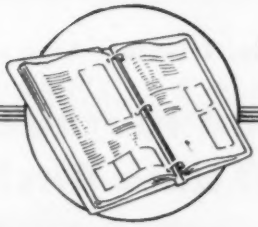

THE REFINER'S notebook

No. 98

Making Instrument Connections

by H. A. Hulsberg*

INITIAL steps in instrument installation and the use of a flange location check list were taken up in No. 97 of The Refiner's Notebook. In addition to the flange check list, a control-valve check list such as shown on this page may also be useful. On this latter check list the "location" is filled in for the valve and the identification number (in this case, "FRC-32") is marked again. The valve is checked against specifications as to size, material, etc.

The installation man then checks the orientation of flow, making sure that the plug side is upstream rather than the port side. The topworks of the valve is shown vertical on the drawings, so it is mounted in that position, at such a point in the line that it will not foul other parts of the installation, and so that it is accessible and may be readily moved.

Next "orientation of topworks" and "clearance of topworks" is checked off. Later the lubricant, packing adjustment, positioner adjustment, valve action (air open or air close), and stem travel are checked and the valve is stroked to make sure no sticking occurs.

*Head of instrument engineering and service, Universal Oil Products Co. Paper presented at I.S.A. meeting, Houston, 1951.

Level Controllers

As liquid-level controllers are mounted, the installation man should give his attention to the location of the float center in relation to the normal liquid level and to proper shutoff valve and equalizer piping. The location of level taps should be checked to avoid sediment, or water accumulation in the lower connections. Winter protection should also be considered. The relation of the taps to vessel internals, such as baffles, trays, packing, and weirs, should be inspected, since many a false level reading may be traced to improper location of the taps. The same applies to level connections subjected to impingement by an incoming stream.

Prefabricated Control Panel

If a prefabricated control panel has been purchased, and the control house is ready for it, the installation instrument man should supervise the installation carefully to prevent damage to the finish or to the instruments. Damage frequently results during storage. If the panel arrives ahead of time, it should be carefully protected by crating or fences until it is set in place. Where instruments have been mounted prior to being connected, it is well to lock them to avoid tinkering, or "cannibalization" for parts.

Connection stage.—This stage of instrument installation involves considerable attention to detail. At this time, the small piping, electrical and thermocouple leads, air-supply lines, remote transmission lines, valve air lines, meter piping, gas analyzer sampling systems, and hundreds of odds and ends are installed. The degree of help supplied by construction drawings varies at this stage. In some cases, the detail drawings are complete and accurate, which makes the job easy. In other cases, the drawings may be complete, but are taken "off the shelf" from other jobs, and do not apply closely.

With the rapid progress of instrumentation, this is too often the case, and it can result in severe headaches for the installation man, inasmuch as he must depend upon his judgment considerably, or must contact the instrument manufacturer or the instrument engineering department. Some firms rely heavily on the field man for installation details. This may be successful if the field man is of high caliber and keeps in contact with new developments. It may be disastrous otherwise.

Running Tubing and Electric Lines

Running of copper-tubing lines during the connection stage requires a good deal of supervision by the instrument man to insure a neat job, and above all, to see that the lines begin and end where they should without being plugged or leaky. A rigorous leak-testing procedure should be followed. The Instrument Society of America is soon to release a recommended practices report on tubing testing.

As the electricians run thermocouple leads, they should be checked for proper termination by being "rung out" or by checking with an ohm-meter. A telephone set, sound powered if possible, is of great help during this operation and during later testing and calibration. Other leads such as pH meter leads, resistance thermometer wires, alarm wires, and remote electric transmission systems are checked in a similar manner. All electrical leads should be inspected for suitable insulation for moisture conditions, and for special insulation as they pass through zones of high ambient temperature.

CONTROL VALVE INSTALLATION CHECK LIST

Project No.
Checked by

LOCATION
IDENTIFICATION NUMBER

- **Valve per specification**
- **Piping per specification**
- **Orientation of flow**
- **Orientation of topworks**
- **Clearance of topworks**
- **Packing**
- **Action checked**
- **Positioner checked**
- **Lubricant**
- **Stem travel**
- **Stroke**
- **Valve air line tested**
- **Flushing connection**

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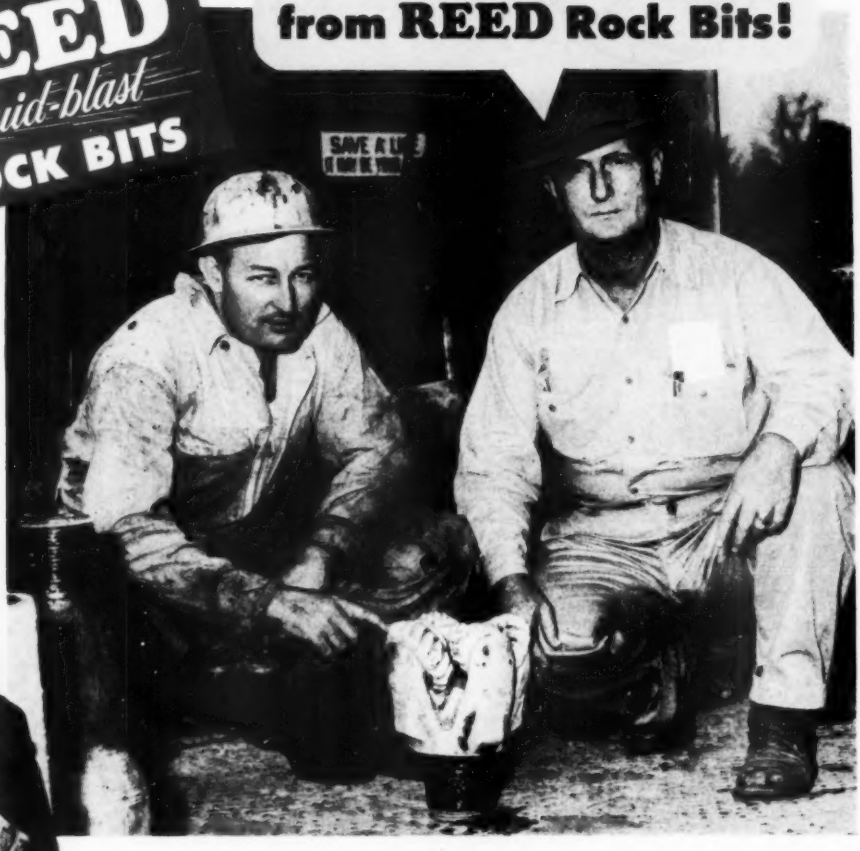

M. L. Eakins, driller, and L. A. Bates, tool pusher for Delta Drilling Company, are shown with a **REED** Liquid-Blast 2HM Rock Bit. The 2HM gives fast drilling and long runs in the medium hard formations.

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PROGRESS in METALS

by W. L. Nelson
Consulting Engineer

Knitted Mesh Mist Eliminators

THE elimination of mist or particles of liquid from streams of vapor is an important consideration in regard to many refinery operations. Liquid particles tend to be carried out of separation equipment by the vapor stream. Thus in a boiler, moisture is removed from steam at the outlet steam line of the steam disengaging drum, resulting in a higher quality steam, less need of steam traps, and less need of steam superheat. Likewise, moisture or liquid is removed from gases that are entering solid-bed dryers, or that are about to enter the suction of compressors. Mist extractors or eliminators are used in the tops of many absorption and stripping towers, as well as fractionators, scrubbing towers, knockout drums, evaporators, flash towers, etc.

The action of such a mist eliminator in filtering out or separating liquid droplets is indicated in Fig. 1. Pad sections are built up to the desired thickness from multiple layers of knitted mesh as shown in Fig. 2. The pad may be built in sections so that it can be passed through a manhole and then assembled within the equipment.

Of course, the liquid particles can be eliminated to a large extent by allowing a large headroom, but 10 or even 30 ft. of (vacant) space or headroom is sometimes required to separate fine liquid particles. Still another method is to greatly slow down the velocity of the vapor stream but this requires a larger cross-sectional diameter in the drum or separator.

Entrainment within fractionating towers is particularly important above the feed plate, at the top, or below each side-draw product but if the material being fractionated is free from solid debris and is noncorrosive, the use of eliminators between each tray may be found to be feasible. Solid materials in the vapor stream such as coke, dust, corrosion or pipe scale, etc., may cause plugging of the mesh but corrosion of the mesh itself can be avoided by the use of stainless steel, Monel, copper, or aluminum wire in the mesh rather than plain steel.

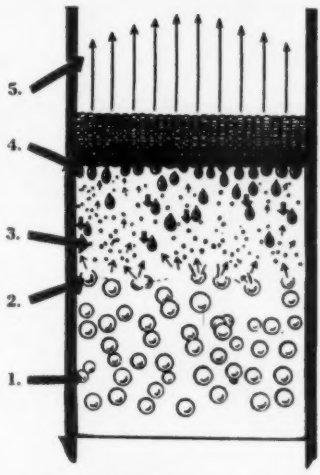


Fig. 1—Mechanism by which liquid particles are eliminated.

1. Gas or vapor stream carrying liquid particles.
2. As the gas rushes into the small openings of the mesh, any gas bubbles that are present tend to burst and produce a fine spray of liquid.
3. The liquid particles are carried upward by the gas stream into:
4. A zone where larger droplets and liquid are held between the fine openings of the mesh. Liquid drains continuously from the mesh.
5. Liquid-free gas escapes from the top of the mesh.

Many methods of producing a torturous or abruptly turning path of vapor have been devised but one of the best is the knitted mesh screen of Metal Textile Corp. Knitted mesh differs from the more conventional woven structures in that the mesh is a series of interlacing loops. This provides a flexible fabric as against the relatively stiff surface of a woven fabric, and the flexibility allows the fabric to be compressed, bent, or shaped into pads that are highly heterogenous. Compressed mesh pads for use as filters is indicated in Fig. 3. Each loop has some degree of springiness and this permits the mesh to be crushed (often in several layers) and to fill almost any desired shape. If the pads are less firmly compressed than the examples of Fig. 3, they may be used as cushions or for vibration control.

The critical velocity for air carrying water particles is said to be 10-11 ft. per second, and for oil vapors 6-7 ft. per second. Lower velocities are usually employed,—i.e. 5-8 ft. per second and 2-4 ft. per second respectively.

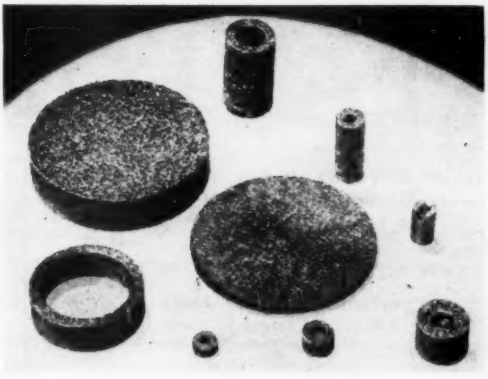
Brazing Terms

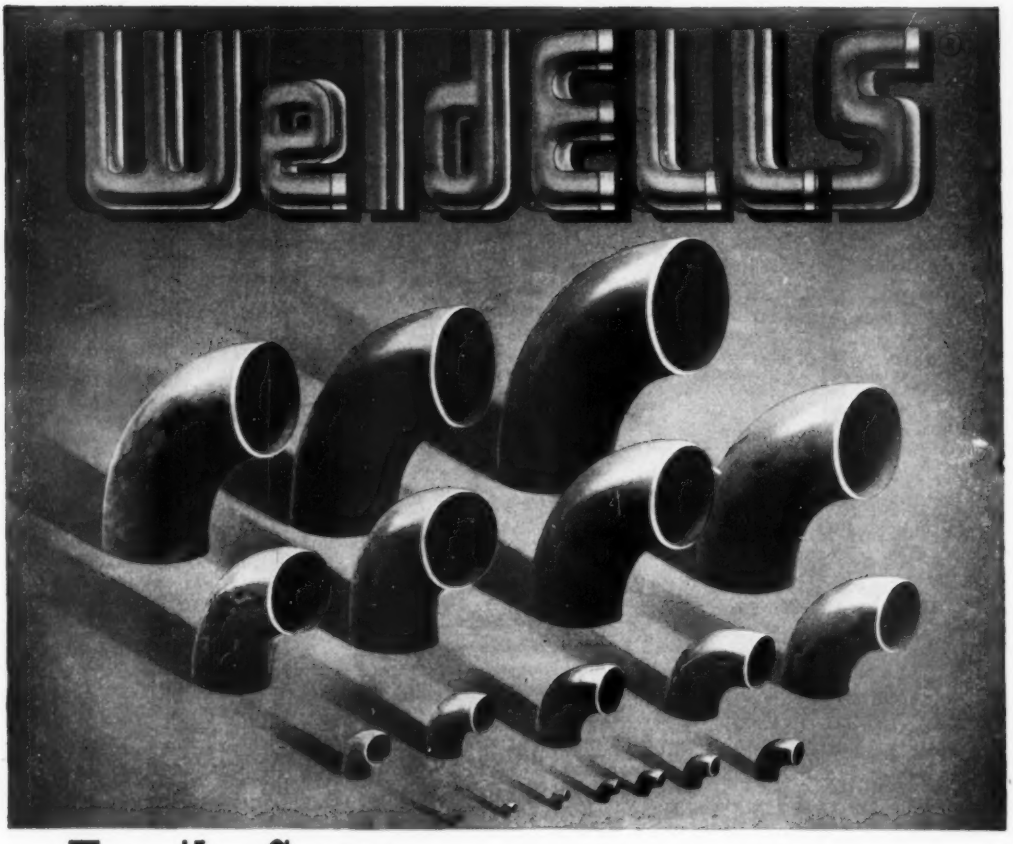
Resistance brazing.—An electric-brazing process wherein the heat is obtained from the resistance to the flow of an electric current.

Electric, furnace, and gas brazing.—The several brazing processes wherein heat is obtained from an electric current, from a furnace, or from a gas flame.

Fig. 2—(Below) A 4-ft.-diameter mist eliminator showing the sectional construction.

Fig. 3—(Right) Example of several small filters constructed of compressed mesh.





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OIL AND GAS EQUIPMENT Digest

IT'S NEW — CHECK IT

TRADE LITERATURE

1 THE DEPENDABLE DIESEL is a magazine featuring actual case histories of the performance of Cummins diesels in a variety of applications. *Cummins Engine Co., Inc.*

2 NEW FIRE-EXTINGUISHER GUIDE, a two-color, 12 by 22-in. poster tells employes the correct fire extinguisher to use on rubbish, wood, inflammable liquid, or electrical-type fires. Illustrating all standard-type fire extinguishers, the poster is ideal for posting at strategic plant locations or for employe lectures. *Randolph Laboratories, Inc.*

3 TRI-CLAD INDUCTION FREQUENCY CONVERTERS. A new four-page, two-color bulletin covers three-phase equipment in ratings from ¾ to 100 kw. It describes the fundamentals, operation, and construction features of the high-frequency power-supply apparatus and includes application information and complete tables of ratings. *General Electric Co.*

4 pH AND CONDUCTIVITY RECORDERS AND CONTROLLERS, a new 40-page catalog No. 15-16 covering pH (hydrogen ion concentration), oxidation-reduction potential, and electrolytic conductivity contains up-to-date information on equipment for these vital process variables. *Minneapolis-Honeywell Regulator Co.*

5 CALIBRATION SERVICE CATALOG gives full details on flow-rate calibration service now offered to industry. *Fischer & Porter Co.*

6 STEEL AND ALLOY PLATE FABRICATION, an eight-page illustrated bulletin, shows engineering and fabricating facilities for a wide variety of tanks, kettles, towers, reactors, and similar equipment. Photographs show numerous views of fabricating operations, machinery, and completed products. The bulletin describes facilities for shearing, forming, fitting, and welding to meet A.S.M.E. and A.P.I.-A.S.M.E. codes. *The Colonial Iron Works Co.*

7 ANALYSIS OF ALKALIES BULLETIN contains 72 pages of text, tables, charts, and indexes. New additions or revisions include the recalculation of analytical factors to the basis of the 1948 International Atomic Weights, a colorimetric test for iron and copper, and a temperature correction table for volumetric solutions. *The Solvay Sales Division, Allied Chemical & Dye Corp.*

8 SR-4 PRESSURE CELL. Application of the SR-4 fluid pressure measuring system in oil and chemical processing for automatic control, remote indicating and recording, is featured in a new four-page bulletin. The bulletin covers the principles of the SR-4 bonded resistance wire strain gage and pressure cells, electrical transmission of pressure variations with only 4 to 8 volts and currents of less than 0.07 amp., and elimination of the fire and explosion hazard of oil or gas transmission to control panels. *Baldwin-Lima-Hamilton Corp.*

9 NEW TEFC MOTORS BULLETIN. Construction details of a totally enclosed, fan-cooled motor (Type APZ) are described in a new bulletin. Due to the elimination of internal

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Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, Nov. 22, 1951

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air passages and dirt-catching pockets, the motor is easy to keep clean. This feature, together with an efficient cooling system, makes the motor suitable for use where there is dust, dirt, fly ash, rain, snow, or corrosive gases. *Allis-Chalmers Manufacturing Co.*

10 **MUD-TESTING EQUIPMENT** is a new catalog describing in detail an entire line of mud-testing equipment. It illustrates and gives all specification of the fann mud balances and V-G (viscosimeter) meter and accessories; fann portable and multiple filter presses; small-size pressure adapters for older types of filter presses; and mud mixers. *Geophysical Machine Works.*

11 **OIL-FIELD JACKS.** A complete line of lifting and lowering jacks for service in oil fields and refineries is illustrated and described in a new four-page bulletin. Featured is the No. 1523 all-purpose oil-field jack, which is applicable for four types of jacking: straight lifting, chain lifting, claw lifting, and foot lifting. *The Duff-Norton Manufacturing Co.*

12 **THE USE OF TENITE TO COMBAT CORROSION IN PIPING SYSTEMS** is a fully illustrated story of noncorrodible butyrate plastic pipe in the oil fields. The text discusses the corrosion problem faced by an oil lease layout, and the characteristics of Tenite tubing which have made this plastic ideal for lines carrying sour crude oil. Twenty-six photographs taken in the oil fields show how Tenite pipe is installed and used. *Tennessee Eastman Co.*

13 **CENTRIFUGAL PUMPS FOR REFINERY SERVICE.** A revised 12-page bulletin W-341-B2C describes types HR and HB one and two-stage volute, saddle-mounted, vertically split centrifugal pumps. Dimensions and cross-section line drawings are included. *Worthington Pump & Machinery Corp.*

14 **THE LATEST MALLINCKRODT A.R. CATALOG** lists the more than 400 analytical reagents, many with higher standards of purity than ever before. Under each analytical reagent is listed its maximum limits of impurities. *Mallinckrodt Chemical Works.*

15 **GEOLOGRAPH TIME WILL TELL,** a 12-page, multicolor booklet explains a streamlined well-logging service whereby you log while you drill. Annotated photographs describe in detail the operation of the equipment. A typical log chart is reproduced with marginal notes explaining what took place. *Geolograph Co.*

16 **INDUCTION FREQUENCY CONVERTERS,** a new four-page, two-color bulletin on Tri-Clad induction frequency converters, is designated as publication GEA-5637. The booklet covers three-phase equipment in ratings from ¾ to 100 kw. It describes the fundamentals, operation, and construction features of high-frequency power-supply apparatus, and includes application information, modifications, and limitations, and complete tables of ratings and frame sizes. *General Electric Co.*

17 **CONDOR V-BELTS** is a bulletin describing the "precision balanced" and "more grip, less slip" features built into Condor V-belts. Straight sidewalls and straight-in-line cords in the strength member are given as reasons why Condor V-belts are smooth running and long lasting. Construction features, based on recently developed precision-control methods and stronger materials, are explained. Interesting installations are shown and a table of standard industrial sizes and list prices are included in the folder. *Raybestos-Manhattan, Inc.*

18 **NEW BUSHWACKER CATALOG.** A series of on-the-job action photographs illustrates the principle of operation, rate of production, and final results at a typical job site of the Bushwacker, a heavy-duty, tractor-mounted machine for low-cost land-clearing operation. Complete specifications and operating data are also included. *American Steel Dredge Co., Inc.*

19 **CATERPILLAR D13000.** Conversion of the Caterpillar D13000 diesel engine to a heavy-duty, spark-ignition, natural-gas engine is the subject of a new four-page booklet. The booklet describes the low operating costs and versatility of this converted engine, designed for use wherever there is a plentiful supply of natural gas. A field or factory-installed conversion arrangement consisting of cylinder-head group, magneto group, and carburetor group is described in detail. *Caterpillar Tractor Co.*

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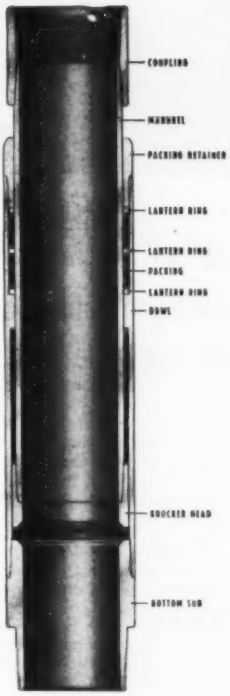
OIL AND GAS EQUIPMENT Digest

IT'S NEW CHECK IT

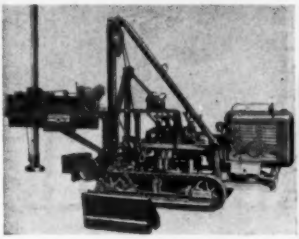
by Dan B. Miller

20 CASING THUMPER provides the additional force required to drive the casing down slant or tight holes. Mandrel and bowl are free to move longitudinally a limited amount in relation to each other and are packed off to prevent fluid leakage from either internal or external pressures. All types of "inside the casing operations" can be conducted after the string is landed because the bore through the Thumper corresponds with the internal diameter of the casing. When the casing string is relatively short, the Thumper is installed midway in the string. A heavy downward blow can be repeated as often as required. Should it prove impossible to drive the casing down the hole, the Thumper can be used effectively to strike upward blows to free the casing and permit its withdrawal. When the casing string is relatively long, best results are realized by installing a series of Thumpers at strategic intervals in the string. *S. R. Bowen Co.*



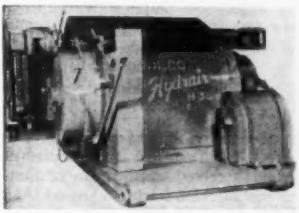
IT'S NEW CHECK IT

21 MODEL 80 TAMPER-BACKFILLER-SIDE CRANE is a one-man-operated machine that tamps, backfills, lays pipe, unloads and handles pipe and sheathing, and does all types of light crane work. The machine is mounted on a crawler having 24 separate travel speeds, ranging from 1 ft. per minute up to 2⅛ mph. The Model 80 tamps while traveling either along the side of the trench or straddling it. The tamper delivers a 380-ft.-lb. blow, 45 times each minute, compacting the earth in layers that are 3 to 4 times thicker than is practical by air or hand tamping. Backfiller is a conventional drag-line type with a telescopic boom. It backfills from either side of trench. The strong, power-operated boom lays pipe with extraordinary efficiency and speed. All of the light crane duties involved in trench operations are within its scope. Without extra counterweights, it will lift a weight of 6,000 lb. located 3 ft. from the edge of the crawler track. Standard boom sections are extendable to 15 ft. *The Cleveland Trencher Co.*



IT'S NEW CHECK IT

22 NEW 350-HP. HYDRAIR RIG. Designed for one or two-engine application this new Hydrair incorporates such outstanding features as totally enclosed oil-bath lubrication of all chain drives, provision for an auxiliary hydromatic or dynamatic brake, long main and upper drums, catshaft cutout clutch, finger-tip air controls, air clutches, and torque-converter performance. The Hydrair H-35 is available in single and double-drum models, and is rated for drilling to 5,000 ft. with 4½-in. drill pipe. Servicing and workover models are also available with an extra-



The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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DOWELL magnesium anodes

provide effective corrosion control on distribution piping systems with negligible "interference"

Cathodic protection to control corrosion on complicated municipal gas and water distribution systems poses the problem of "cathodic interference." This occurs where current from a protected system is of such high voltage that it imposes itself on a neighboring unprotected system and accelerates corrosion.

When Dowell magnesium anodes are used to provide the current for cathodic protection, such interference is negligible. The driving voltage of magnesium, approximately 1 volt negative, is sufficient to give protection in most cases, yet low enough so that interference with neighboring systems is minimized. Dowell magnesium anodes can provide effective corrosion control—and still be "good neighbors"!

Dowell magnesium anodes provide real advantages in economy, too. They are easily installed and require no external source of power. A recent application of magnesium anodes to a gas distribution system showed that, on one section, new leaks were cut from 24 in *one* year to only 3 in *five* years, with a 96% saving in leak repair expenses. Costs involved indicated that it is possible to maintain complete cathodic protection for less than $10.00 per year per mile of 3 inch, or equivalent, pipe.

Call the nearest Dowell office or write to Tulsa for more information on this economical, effective and highly practical means of cutting your corrosion costs.

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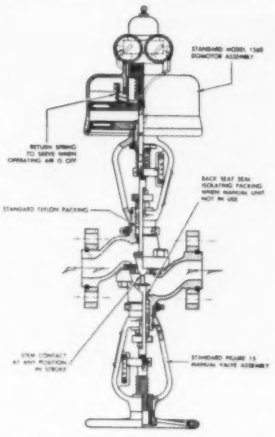
large upper drum which has a spooling capacity of 16,400 ft. of 9/16-in. wire line. A mud-pump drive can be furnished mounted at the rear of the draw works. *Ideco.*

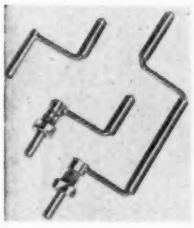
IT'S NEW CHECK IT

23 AUTOMATIC MANUAL COMBINATION CONTROL VALVE. The automatic manual combination is meeting considerable favor in continuous - process - control applications where the handwheel unit allows instant manual control for start-up operations and for instrument repair, thus eliminating cost of a bypass valving system. This assembly has all of the advantages of continuous connections of the handwheel with the plug and stem assembly of the control valve without the usual complications. The stem of the handwheel valve simply contacts the end of the valve plug and positions it instantly and accurately whether the control valve is in operation or not. Loading pressure on top of the control valve provides only a minimum continuous load to be overcome by the handwheel. *The Annin Co.*



IT'S NEW CHECK IT

24 CAMPBELL WINDER-UPPER. The key to a meter or other spring-wound control instruments becomes a crank. It is made in three types. The simplest, Type A, consists of a key end and crank. Type B includes a torque chuck with a slip - grip arrangement which converts the crank into a combination torque wrench and crank so that the instrument cannot be overwound. Type C is the same as Type B but is a brace design to prevent wobble. Easy, quick winding can be accomplished for spring-driven motors, clocks, temperature controls, orifice-chart meters, and instrument devices. *J. A. Campbell Co.*

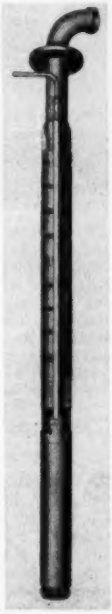


IT'S NEW CHECK IT

25 MACCOTAN is a specially compounded chemical thinner for clay-water muds or clay-water-oil emulsion muds formulated for the express purpose of replacing quebracho. The product provides low-cost thinning; may be used pound for pound in place of quebracho; and requires less caustic soda than the latter. It may be used in conjunction with a complex phosphate without caustic soda for most applications. It is a dry nonhygroscopic powder packaged in strong four-ply paper bags containing 50 lb. net weight. It is noninjurious to eyes and hands, is noncaking, and will remain readily pourable despite long, damp storage. It may be added directly to the mud system through the hopper, or for quicker action may be dissolved with caustic soda or with a complex phosphate in the chemical tank and added in liquid form. *Drilling Fluid Division, Macco Corp.*

IT'S NEW CHECK IT

26 NEW SMALL SUBMERSIBLE PUMP. The "Subette" is a small submersible pump designed for small capacities at high heads from wells of 6-in. i.d. or larger. This pump has a capacity range of from 30 to 130 g.p.m. at heads of from 80 to 770 ft. The motors, available in sizes of 5, 7½, 10, and 15 hp., are 3-phase, 60-cycle, 2-pole, 220/440-volt and have a speed of 3,500 r.p.m. A 50-cycle motor is available at a speed of 2,900 r.p.m. All motors are oil filled, mechanically sealed, and capable of operating completely submerged in water. It entirely eliminates the alignment and bearing protection problems of shaft-type installations. The number of moving parts is reduced to a minimum. *Byron Jackson Co.*



IT'S NEW CHECK IT

27 NEW CHEMICAL WEED KILLER. A new nonselective chemical weed killer which "erases" dense growths of mixed grasses and broad-leaf weeds, leaves only an expanse of bare soil. Known as CMU, short for 3-(p-chlorophenyl)-1, 1-dimethylurea, the chemical has undergone extensive tests under a wide range of field conditions during the past year. CMU is not flammable or corrosive. It is relatively nonvolatile and can be applied as a spray, using a wettable powder dispersed in water. *E. I. du Pont de Nemours & Co. (Inc.).*

IT'S NEW CHECK IT

28 SERIES 21 QUICK COUPLING CLAMP. Featuring a new hinged latch for quick assembly or removal, this clamp is especially designed for convenience in handling removable equipment. It assures an efficient seal for all types of hose and duct connections. The unique design used in the latch assembly to give extreme strength combines with its all-stainless-steel construction to make this clamp suitable for high-temperature, pressure, and cor-

rosion resistance. The unit has an extremely high strength-to-weight ratio. *Specialty Products Co.*

IT'S NEW CHECK IT

29 PREFABRICATED SHELTERS for microwave and other equipment are now being supplied as a single packaged unit. They are manufactured of Thermo-Con, a lightweight concrete, and arrive at the site complete in every respect. The shockproof quality of the structure permits transportation on truck, rail, or barge. The high insulating value of the building makes automatic control of temperature a minor problem. As the shelter is made in one pour, cracks are nonexistent and the walls are completely waterproof. The wiring is in concealed conduits. The structures are made in any desired size and may be constructed with a telescoping exterior to house auxiliary units. Mobile construction equipment makes possible, in sizable contracts, the fabrication of the buildings at or near the final location. *Thermo-Con Texas Corp.*

IT'S NEW CHECK IT

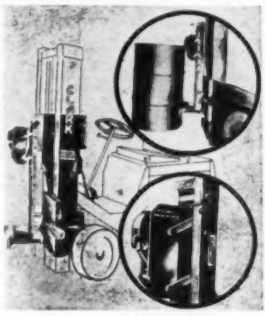
30 CHEMICAL CARTRIDGE RESPIRATORS. Known as the 800 series, the line includes styles for protection against low concentrations of many common industrial gases and vapors, as well as metal fumes, mists, and dusts. Principal features of the new respirators are: newly designed facepiece, with featured rolled edges for snug, comfortable fit and exhalation valve positioned to minimize possibility of dust interfering with normal operation: A choice of three cartridge sizes is available including 60 cc., 85 cc., and 100 cc. Double adjustable elastic headbands are standard. *Willson Products, Inc.*

IT'S NEW CHECK IT

31 ECONO MAGIC is a new oil-base material that is mixed with crude oil for use in completing shallow, cold wells, for workovers, and for redrilling into depleted oil sands. It is light in weight and low in cost. Plastering properties are excellent; it deposits a paper-thin mud cake and is highly recommended where lost circulation in oil sands is a problem. It will not lose water with the filtrate under normal temperatures, but high temperatures and conditions requiring excellent weight material suspension ability are to be avoided. Econo Magic is a white powder, packaged in 50-lb.-net sacks. Ten lb. of Econo Magic to a barrel of crude or fuel oil is adequate to produce a good oil-base mud. A low-gravity asphaltic-type crude oil gives the best results. *Oil Base, Inc.*

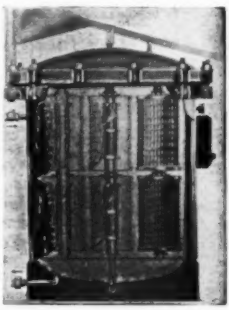
IT'S NEW CHECK IT

32 LIFTOMATIC is a power truck attachment for handling drums. Made to fit any make power truck, the Liftomatic can be attached or removed from the truck by one operator in just a few minutes. Any drum can be handled, fiber or steel, regardless of diameter, height, bead, or rim size. The Liftomatic is mechanical and completely automatic. No additional power controls are needed, as pickup and release are effected through raising or lowering truck cylinder. Liftomatic allows transportation, tiering, and exact placement without the use of pallets or dunnage. *Marvel Industries, Inc.*



IT'S NEW CHECK IT

33 HYFLOW LUBRICATING AND FUEL OIL FILTERS. These new units include swingbolt head construction for quick opening of filter covers and a lifting device for ease of handling the cover. Filters are available using factory-made throwaway cartridges or the repackable type which the operator repacks from bulk supply of filtering materials. Filtering materials are available for use in these units for handling straightrun mineral oils, or the heavy-duty detergent-type oils, a feature being that all types of filter cartridges are interchangeable. Filters are available in capacities ranging from ½ g.p.m. up to 1,000 g.p.m., for fuel-oil filtering, lubricating-oil bypass, or full-flow filtering. *Hilliard Corp.*



IT'S NEW CHECK IT

34 AUTOMATIC AIRCHECK VALVE absolutely safeguards against the forgetfulness of operating personnel to open a valve when starting up. The automatic Aircheck valve dispenses with customary arrangement of stop, safety and globe valves; prevents leakage of pressure through the compressor during the off cycle; dampens pipe-line pulsations; and permits repairs without shutting down the system where more than one compressor is on the line. *Pennsylvania Pump & Compressor Co.*

NATURAL GAS

Exports Battle

Coal interests combine to block gas from Canada

WASHINGTON. — Coal interests in both the United States and Canada are pressing their fight to thwart exports of Alberta natural gas to this country.

Organized operators and mine workers from both countries joined forces to present their case at the final hearing of the Alberta Petroleum and Natural Gas Conservation Board before the board submits a report to the Alberta Government on whether to permit gas exports from Alberta by any of six applicants.

In testifying on his firm's proposal to export to this country's Pacific Northwest, D. P. McDonald, counsel for Westcoast Transmission Co., said that it would cost between 22.45 cents per M.c.f. to transport gas from Pincher Creek field in Alberta to Spokane, Wash., in the fifth year of operation, exclusive of the cost of the gas.

New development. — Latest development in the race to market Alberta's gas was Northwest Natural Gas Co. and Canadian Gulf Oil Co.'s filing with the conservation board of a 25-year agreement for disposal of Pincher Creek reserves.

Northwest plans construction of a $71,611,000 24-in. pipe line with a capacity of 285,000,000 cu. ft. daily to serve the Pacific Northwest of the United States, Vancouver, and other centers.

Under the agreement, Northwest will pay 10¾ cents per M.c.f. for the first 3 years, and an additional ¼ cent yearly for the next 22 years. Gulf reserves the right to terminate the contract if Northwest has not secured all necessary government permits, both from the United States and Canada, by August 15, 1952.

The agreement also provides that Northwest must buy at least 90 per cent of its requirements during the first year from Gulf, 81 per cent during the second year, and 70 per cent during the third year. From then on it must take an average of 156,000,000 cu. ft. a day.

Gulf would start drilling more wells as soon as Northwest has the steel and all required permits and would continue drilling as required. Gulf would also set up a gas-treating plan.

Montana hearing.—Meanwhile in the United States, the Federal Power Commission scheduled an oral argument for December 7 in Washington on Montana Power Co.'s proposal to import up to 10 billion cubic feet of gas per year for the sole use of Anaconda Copper Mining Co.

The argument was requested by three intervenors, the National Coal Association, the United Mine Workers of America, and the Railway Labor Executives Association.

The opposition contended that Montana Power's proposal would establish precedents which would be reflected in subsequent applications to import gas from Canada. Granting of the application would be considered as an attempt to inaugurate the practice of importing natural gas to the detriment of the intervenors, they said.

Firms Get PAD Permission For Gas-Service Expansion

WASHINGTON.—Seven natural-gas companies have been given exceptions from provisions of the Petroleum Administration's gas-restriction order to permit them to extend space-heating service to a limited number of new customers.

Applications of 19 other companies have been denied. Fourteen of these, all in Massachusetts, were rejected on grounds that the order itself gives them sufficient room for normal expansion.

The exceptions given the seven companies were based on a finding by Assistant Deputy Administrator C. Pratt Rather that they had adequate supplies of gas to serve additional customers without endangering the defense effort.

One company, Consumers Power Co., of Jackson, Mich., previously was granted an exemption from the order on a finding that it had ample gas supplies. The seven companies were given permission to add from 38 to 1,700 new customers during the year beginning last August 22, as follows:

Battle Creek Gas Co., Battle Creek, Mich., 1,244; Michigan Gas Utilities Co., Monroe, Mich., division, 740; Southeastern Michigan Gas Co., Lansing, Mich., 1,700; Albion Gas Light Co., Albion, Mich., 231; City Gas Co., Flemington, N. J., 38; New York State Electric & Gas Corp., Ithaca, N. Y., 109; Bath Electric, Gas & Water Co., Bath, N. Y., 125.

In addition to the 14 Massachusetts companies, 2 companies in New Jersey and 3 in New York were denied exemptions.

Revenue From Texas' New Gas Tax Below Predictions

AUSTIN. — Revenue from Texas' new gas-gathering tax fell far below predictions for the first month it has been in effect.

State Comptroller Robert S. Calvert's financial report showed cash receipts from the new tax totaled $216,966 during October. This figure, however, does not reflect the actual amount paid. All payments totaled $845.704, of which $415,282 was under protest.

The money paid under protest is frozen. The state cannot use it to help meet expenses of government pending settlement of the dispute. Calvert said the state would probably go into the red within 6 to 8 months if the same gas-gathering firms continued to protest payments.

Sales in Year Ended in September Set New High

NEW YORK.—Natural-gas sales by utilities during the 12 months ended September 30 reached an all-time high level of 43,075 million therms, the American Gas Association reported last week.

This was an increase of 17.1 per cent over the 36,787 million therms sold during the same period last year. Manufactured and mixed-gas sales during the year were down 3.7 per cent to total 3,397 million therms.

Sales of natural gas in September totaled 3,179 million therms, 13.9 per cent over those in September 1950. Manufactured and mixed-gas sales during the month were down 3.4 cent from September of last year.

Natural Gasoline

N.G.A.A. Meeting Features Plant-Control Symposium

AMARILLO. — A symposium on plant-control testing was featured at the Natural Gasoline Association of America Panhandle Plains regional meeting held here on November 20. A discussion of "Engler Distillation and Oil Saturation Tests" by H. R. Harris of Phillips Petroleum Co., Phillips, Tex., dealt with the two tests used to measure the degree of separation obtained in stripping of gasoline from absorption oil. Standard procedures for making these tests and the magnitude of errors that occur when deviating from the standards were dealt with.

Other papers in the symposium were: "Plant-Control Tests—Significance and Limitations," C. R. Rogers and J. R. Dungan, Lone Star Producing Co., Dallas, and "Determining Vapor Pressure by Reid and L.P.G. Methods," J. F. Wood, Skelly Oil Co., Pawhuska, Okla.

In the afternoon session J. B. Williams and V. E. Ford, Clark Brothers Co., Tulsa, reviewed "General Maintenance of Vertical Engines," in which a check list was detailed for daily, weekly, and other periodical maintenance checks on vertical gas-engine-driven compressors.

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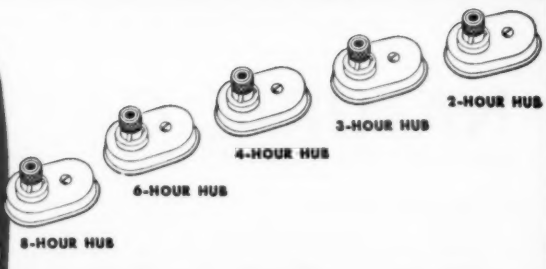

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Illustrating how the Turrets lock onto the chart arbor to change rotation speeds. This conversion feature is also available on the 8-day Rockwell midget drive.

For replacement service, the Rockwell standard chart drive is the most versatile, economical you can use. It is thinner than other drives and so can be correctly located in practically any instrument case by means of simple adaptors. One adaptor is furnished with each drive. Rotation speeds are no problem, either. Speed changing Turrets lock onto the chart arbor to provide any one of 11 rotation speeds. Think what this means in reduced inventory, service work, all-around flexibility of application.

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Write for Bulletin 1079

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Compact, powerful drives for use in instruments when space is at a premium. They feature a detachable escapement, sealed in clear plastic. They wind through the chart arbor, snap into separate mounting rings which may be positioned on bosses or adaptors to fit any instrument case.

REFINING

Pan-Am Southern Contracts For New Petrochemical Units

EL DORADO, Ark.—Pan-Am Southern Corp. has awarded contracts for construction of two petrochemicals-manufacturing units—its first venture in this field.

The new units will produce about 2,000,000 gal. per year of polybutene (more than the nation's current production), plus 3,800,000 gal. of propylene tetramer.

The polybutene plant is scheduled to be completed by February 1952. The propylene-tetramer unit is being built by revamping the existing polymerization unit so that it can be switched quickly to high-grade poly gasoline in case of a market drop in demands for tetramer.

Polybutane is made in only two other refineries in the world. It is used in making motor-oil additives, calking and sealing compounds, and many other products. Propylene tetramer is used primarily in manufacturing synthetic detergents.

Deep Rock Lets Contract For New Lube-Oil Plant

CUSHING, Okla.—Deep Rock Oil Corp. has let contract to M. W. Kellogg Co. for a new lubricating-oil plant at its refinery here.

The new unit, to have a capacity of 930 bbl. of finished oils daily, will utilize the propane-deasphalting and phenol-solvent refining processes. Engineering has already been started, and completion is expected by December of next year.

Auxiliary facilities for the new lube plant, including additional tankage, water-cooling tower, and other offsite units, will be constructed by Refinery Engineering Co.

The company announced earlier the impending construction by Blaw-Knox Construction Co.'s chemical-plants division of a new Deep Rock blending and packaging plant. Major new construction recently completed at the 18,000-bbl. Cushing refinery includes a crude still, fluid catalytic cracking unit, research laboratory, and office buildings.

Domestic Asphalt Sales Up 18 Per Cent in 1950

WASHINGTON.—Recorded domestic sales of asphalt during 1950 totaled 10,528,400 tons, 18 per cent more than in 1949. They were valued at $177,563,593 f.o.b. refinery.

Of the total petroleum asphalt sold to domestic consumers in 1950, 25 per cent was manufactured from foreign petroleum (imported mainly from Venezuela, Colombia, and Mexico). This compares with 23 per cent in 1949. Of the asphalt made from foreign petroleum, 94 per cent was manufactured in refineries along the East Coast of the United States.

Highway and street construction (in the form of paving asphalt, paving flux, cutback asphalt, and asphalt emulsions) used 65 per cent of the total asphalt sold to domestic consumers by refineries in 1950, compared with 70 per cent in 1949.

Roofing manufacturers made the second largest demand for asphalt, using 27 per cent in 1950 as against 25 per cent in 1949. Sales quantities of bituminous rock, gilsonite, and road oil also increased.

Imports of petroleum asphalt totaled 323,571 short tons compared with 213,967 in 1949, most of these were from the Netherlands Antilles.

Progress Made in Reducing Lubes Needed by Military

CHICAGO.—A reduction in the number of lubricants required by the military will simplify the manufacturing problems for industry and the logistics problems for the services. Some progress toward this end was reported recently by Dr. Carl W. Kelley, Office of Petroleum Programs, Munitions Board, to the National Lubricating Grease Institute.

IDEA PAYS OFF.—Robert L. Minckler (left), president of General Petroleum Corp., and Howard H. Hannon, refinery worker, look over a newly developed catalyst sampler. Hannon's idea for the device netted him $1,500 under General Petroleum's suggestion plan. The sampler, when used with the company's T.C.C. unit, makes possible the taking of samples of the catalyst stream at any desired interval without interference to operation of the unit. Samples are removed by inserting the device into a special opening located between the unit's regenerator outlet and its elevator.

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You can wear the Acme Full-Vision Mask two or three times as long as others without worrying about "huff and puff." An exclusive Acme feature, the Dead Air Check Valve, actually limits the amount of carbon dioxide the wearer rebreathes and thus helps to check breathing difficulties at their source.

This is another Acme innovation that proves that protection can be comfortable.

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Invest $14.62 For Increased Boiler Efficiency

The INFERNO stream-lined steam stack blower will secure additional capacity from your boilers for a fraction of the steam generated. When operating a boiler at 200% of capacity, Inferno Stack Blower consumes only 2% of steam generated. Only 10% is consumed when operating at 425%. Less efficient stack blowers often consume up to 20% of steam generated to achieve these same results. Sold through supply stores. Get the details in Bulletin 22-A, write for your free copy.

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R-17 Extra-Duty Pioneer Stanzoil, red neoprene coated fabric, non-slip grip, curved fingers, pre-flex palm and inserted thumb design.

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Over 30 Years of Quality Glove Making

Greatest progress to date is in corrosion preventives. Fourteen specifications in this field have been combined into three with seven grades.

Grease specification MIL-G-3278 resulted from a combination of (AN-G-25) and (2-134) with Bu Aer as the custodian. Amendment 1 is in progress. Extreme-pressure grease, AN-G-10, low and high temperature, has become MIL-G-7188 (1). Lubricating grease, general purpose, aircraft MIL-L-7711, is the new name of the general purpose grease, AN-G-15A. The corrosion -preventive properties of this specification are considered inadequate, and there is some feeling that it could be superseded by MIL-G-3278.

For some time the Army has been working on a single all-purpose, all-temperature automotive and artillery grease which would be the principal item of field supply. A specification of this nature is now possible, to be coordinated as lubricating grease, automotive and artillery, MIL-E-10924, superseding 10 existing specifications.

A.I.Ch.E. Plans Research on Bubble-Plate Efficiency

NEW YORK.—The first project to be undertaken by the newly organized Research Committee of American Institute of Chemical Engineers is a detailed study of bubble-plate efficiency. Committee Chairman Walter E. Lobo, director of the chemical-engineering division of M. W. Kellogg Co., said the study was chosen because of the wide application of distillation techniques in the chemical, petroleum, and other process industries.

The idea behind the new association program is to foster research projects which, by their scope, complexity, or general nature, are such that no single institution or company can afford to institute a comprehensive planned research program. As now set up, the project calls for variations in column size and tray spacing with a wide range of operating pressures and systems. This will permit thorough evaluation of the individual effect of gas and liquid phases on the efficiency of separation.

The program now awaits only final approval of the Research Committee budget by the institute council and the active solicitation of funds for its operation from interested industrial organizations.

Refining Briefs

Standard Oil Co. of California has let a $1,500,000 contract to Bechtel Corp. for expanding alkane-manufacturing facilities at its Richmond, Calif., refinery. The new facilities will increase the plant's production capacity to 3,000 bbl. per calendar day.

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A user reports this test made on a BARTON Flowmeter with a 25" W.C. differential range at a pressure level of 1200 psi:

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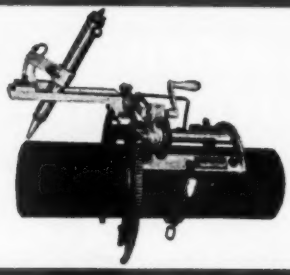
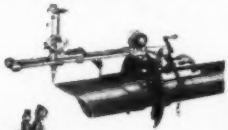


ATTACHMENTS



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Split sprocket shaped gear permits machine to slip quickly over pipe. Fast operating snap clamp fasteners hold it in place. A complete cut and bevel can be made in a 12 inch pipe in about two minutes.

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PIPE LINE ECONOMY BEGINS HERE

Steel pipe is expensive—and sometimes scarce. That's why the wise money is on *protection*—not replacement.

NICOLET Asbestos Pipe Line Felt is designed to provide maximum pipe protection plus maximum economy in application.

Because NICOLET Asbestos Felt is made with high quality Canadian chrysotile fibers, which provide great strength in the felt, the complete roll can be used without breakage. And NICOLET Asbestos Felt is non-rotting because it contains a minimum of impurities and organic matter. This assures longer life and better protection for your pipe investment.

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PIPE LINES

Sinclair Gets Set to Lay Big Crude Line to Chicago

INDEPENDENCE, Kans.—Mills are running pipe for the first section of Sinclair Pipe Line Co.'s 675-mile big-inch crude project from the Cushing and Drumright, Okla., areas to East Chicago, Ind. First shipments of pipe started November 19, and contracts for construction are being let this week.

Laying operations will begin on a 154-mile section of 24-in. from the Cushing-Drumright area to Humboldt, Kans. The line will be 24-in. to a connection with Platte Pipe Line at Salisbury, Mo., and 22-in. from Salisbury on to East Chicago. Initial capacities will be 250,000 bbl. daily for the 24-in. and 150,000 bbl. daily for the 22-in.

Work is proceeding with the approval of the Petroleum Administration for Defense.

Northeastern Finishes First Section of New England Line

SPRINGFIELD, Mass. — Northeastern Gas Transmission Co. has completed the first section of its big New England gas line. The 290-mile project runs from the New York State line to the greater Boston area.

It marks completion of the first phase of Northeastern's $28,000,000 system in New England. The second phase, extension to Connecticut and New Hampshire, will be undertaken next year.

The company last week announced suspension of construction operations for the winter. Company spokesmen said work has been stopped because construction expenditures during winter in the area are out of proportion and are reflected in cost of gas to consumers.

Massachusetts communities now being served include Pittsfield, Springfield, Worcester, Holyoke, Westfield, and Lowell. Other communities to be hooked up include Arlington, Lynn, Haverhill, Beverly, Malden, Melrose, Revere, Salem, Lawrence, Southbridge, Northampton, and Northern Berkshire.

Examiner O.K.'s El Paso's 167,000 M.c.f. Expansion

WASHINGTON. — A presiding examiner of the Federal Power Commission has filed an initial decision authorizing construction by El Paso Natural Gas Co., El Paso, Tex., of two pipe-line expansion projects totaling an increase in system capacity of 167,000,000 cu. ft. per day.

The first project, estimated to cost $22,950,000, would involve construction of about 10½ miles of 30-in. main-loop and 37,160 hp. in new and existing main-line compressor stations. It would make available an additional 100,000,000 cu. ft. of gas per day to present customers in Texas, New Mexico, and Arizona. Other field and gathering facilities were found not to require FPC authorization.

The other El Paso project involves construction of new facilities to boost capacity of its Phoenix-Chandler City-Mesa, Ariz., system by 67,000,000 cu. ft. per day to a total of 143,000,000 cu. ft. These facilities would cost about $1,038,404.

At the same time, the commission rejected an application by Nevada Natural Gas Pipe Line Co., of Las Vegas, Nev., to build a natural-gas pipe line from Arizona to Nevada. The examiner said the project was turned down because the company failed to show availability of its gas supply. Nevada Natural sought a supply of gas from El Paso.

The Nevada Natural project would have extended 114 miles from near Topock, Ariz., to Henderson, Boulder City, and Las Vegas, all in Nevada. It would serve Stauffer Chemical Co., Titanium Metals Corp., and other manufacturers operating portions of the former Basic Magnesium project of World War II, as well as residential, commercial, and industrial consumers in southern Nevada.

Kansas-Nebraska to Build 119 Miles of New Gas Lines

WASHINGTON.—Kansas-Nebraska Natural Gas Co., Inc., of Phillipsburg, Kans., received a Federal Power Commission o.k. last week to build more than 119 miles of various-diameter natural-gas pipe lines in Nebraska and Colorado.

The new facilities will increase the company's system capacity by 18,400,000 cu. ft. per day to a new total of 182,600,000 cu. ft. daily at an estimated cost of $976,330. An additional $202,006 will be spent on construction of distribution systems. The increase in system capacity will provide more gas to meet higher demands in the company's present market areas as well as service to new markets.

The program includes construction of a 15-mile, 6⅝-in. line and an 11-mile, 8⅝-in. line from Big Springs field in Deuel County, Nebraska, to Ogallala, Neb.; 2 miles of 2⅜-in. lateral lines and two town border stations to serve Big Springs and Brule, Neb.; 3 miles of 8⅝-in. line and 5 miles of 4½-in. line from Big Springs field to Ovid, Colo.; 13.5 miles of 2⅜-

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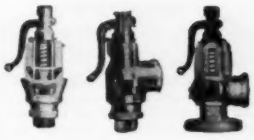

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The safety or relief valve that will release the least pressure after opening is the most economical valve. Economy is a quality in Inferno Safety Pop Valves because they are set and sealed at the factory with the lowest blowdown permitted under ASME codes. Five styles of Inferno Safety Valves available. Sold through supply stores. Write for Bulletin 11-E.

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A fine seam

A fine seam in 14 gauge metal needs more than a needle. For this work you need a machine by Moon. In fact, for any operation in metal box or drum manufacture, you can't beat a Moon machine.

MOON
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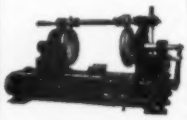
DOUBLE CRANK PRESS



DRUM FLANGER

DOUBLE SEAMER

DOUBLE CRANK PRESS MODEL V.P. This machine is used for cutting circular blanks for drum and keg ends. Fitted with dual-sprung clutch, safety treadle and triple contact rocking key.

DRUM FLANGER MODEL G.F. A compact Double-ended Flanger with enclosed driving and turning mechanism. Fitted with compensating device and self-centering chucks.

DOUBLE SEAMER MODEL P.B. A Single-ended Automatic Drum Double Seaming Machine equipped with air-operated chuck guard, and air-operated clamp.

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"The knowledge of and experience with the Scott Air-Pak enables us to sleep better at night even though four men or more are always in contact with sour . . . gas in the field," says J. R. McMinn, District Superintendent at Trigood.

Trigood is only one of many oil and gas companies who are protecting personnel and economizing on costs by using famous Scott Air-Paks to provide positive breathing protection against toxic petroleum vapors. Simple to operate, Scott Air-Paks provide refreshing supplies of air in any volume required by the individual user. Several models to choose from. Write for Bulletin No. 510 or see your Scott dealer now.

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in. laterals and 10.5 miles of 3½-in. laterals and four town border stations to serve Chappell and Lodge Pole, Neb., Ovid and Julesburg, Neb.; a 52-mile, 8⅝-in. line to replace the existing 4½-in. Ogallala-North Platte, Neb., line; and necessary lateral lines measuring and regulating equipment to serve industrial customers.

Transco's Staten Island Extension Nears Completion

NEW YORK.—Transcontinental Gas Pipe Line Corp. will complete its 11-mile extension across Staten Island and the Arthur Kill and Narrows under-water crossings early next year. The extension is now nearing completion, while dredging operations on the Arthur Kill bottom between Staten Island and the New Jersey shore and the Narrows portion between Staten Island and Brooklyn are well along.

With compressor additions at its stations totaling 46,700 hp. now being installed, Transco will soon be in a position to raise daily deliveries of its present system from 505,000,000 to 555,000,000 cu. ft. The additional 50,000,00 cu. ft. is earmarked for the company's Piedmont area extending through the Carolinas, Virginia, Georgia, and Alabama. The increase in capacity is being accomplished at an estimated cost of $7,235,000.

A new 12-in. crossing of the Delaware River on the company's Camden lateral at Marcus Hook was placed in operation recently. The temporary 6-in. crossing will be kept as a standby for the present.

Platte Radio System Among Those Approved by FCC

WASHINGTON.—Construction permits for 9 base stations, 85 mobile units, 3 operational fixed control stations, and 156 relay transmitters in the petroleum-radio service have been issued by the Federal Communications Commission, as follows:

1. Platte Pipe Line Co. received FCC endorsements for 2 operational fixed control stations near Wood River, Ill., and for 156 relay transmitters located at 39 locations in Wyoming, Kansas, Missouri, Illinois, and Nebraska. The relay system will be used for radiotelephony; radioteletype; facsimile and audio tones; and impulses for signalling, telemetering, and supervisory control. The control transmitters will operate on 6,740 mc. and the relay stations will operate on the frequencies of 6,590, 6,830, 6,680, and 6,740 mc. The authorizations were issued on a development basis.

Platte Pipe Line headquarters at Independence, Kans., will oversee the construction for relay stations, with four transmitters each, in Wyoming, near Guernsey, Ft. Laramie, Yoder, Glen Rock, Douglas, Glendo, and Cassa; in Kansas, near Leona, Beattie, Marysville, and Seneca; in Missouri, near Montgomery, Renick, Bosworth, Salisbury, St. Joseph, Gover, Braymer, Mexico, Troy, and Polo; in Illinois, at Grafter; and in Nebraska, near Deshler, Redington, Elwood, Paxton, Campbell, Mt. Clare, Curley, Dalton, Brule, Diller, Holdrege, Ogallala,

Lodgepole, Wellfleet, Farnam, Stegall, and Gilead.

2. Houston Pipe Line Co. received authorization for a base station to operate on the frequency of 153.26 mc. and an operational fixed control station using the frequency of 75.98 mc., both located near Edna, Tex.

3. McFarland, Inc., for a base station at Midland, Tex., two base stations at temporary locations in West Texas, and 10 mobile units, all on the frequency of 153.71 mc.

4. Sinclair Pipe Line Co. for 4 base stations near Fort Worth, Graham, Muenster, and Wichita Falls, Tex., and 65 mobile units, all on 153.17 mc.

5. Triangle Pipeline Co., for 10 mobile units on 153.29 mc. in southern Arkansas.

6. Buckeye Pipe Line Co., for one base station to operate on 33.22 mc. near Carleton, Mich.

Service Plans Gathering System in North Dakota

The first crude-oil pipe line in the North Dakota portion of the Williston basin will soon be under construction by Service Pipe Line Co.

J. L. Burke, president of the Standard Oil Co. (Ind.) subsidiary, said the company will build a 14-mile gathering system to handle crude production in the Tioga, N. D., area.

According to present plans, the company will build a 12-car loading rack and two 5,000-bbl. tanks at Tioga plus necessary pumping equipment at the leases and at the loading rack. Great Northern Railroad will build a spur line off its road at Tioga to serve the rack.

Burke said Service hopes to have the system ready for operation before severe weather sets in.

Pipe-Line Briefs

Salt Lake Pipe Line Co. has completed and placed in operation two booster stations at Juniper, Idaho, and Baker, Ore., on its products pipe line from Salt Lake City to Pasco, Wash. The stations increase line capacity from the old 17,000 bbl. to 22,000 bbl. daily.

Southwestern Virginia Gas Transmission Co. has been authorized by the Federal Power Commission to build a 17-mile natural-gas line from a connection with Transcontinental Gas Pipe Line Corp.'s system just north of the Virginia-North Carolina state line to bring gas to the Martinsville, Va., area. The line, estimated to cost $220,378, will carry about 500,000 cu. ft. of gas daily.

The Federal Power Commission has set December 12 as the date for hearing Southern Union Gas Co.'s application to build 10 miles of pipe line and a 300-hp. compressor station to increase deliveries of gas in the Clovis, N. M., area. At the same time the commission will hear an El Paso plan to reduce deliveries to West Texas Gas Co., which in turn supplies most of Southern Union's gas.

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Drilling Contractors

Number of Active Rigs Declines in Most Areas

Some slackening of drilling activity was evident during the week ended November 12 (latest survey) as the number of active rotary rigs dropped to 3,030, the lowest reported number since early in October. The total, including all districts of the United States and western Canada, was a decrease of 40 from the number reported the previous week and 53 below the all-time record of 3,083 rigs running during the week ended October 22.

ACTIVE ROTARY RIGS*

(United States and Western Canada)

Area—	Week ended 11-12-51	Change week ended 11-5-51	Change week ended 11-13-50
Gulf Coast	658	+12	+ 75
W. Tex.-N. M.	1,039	— 6	+239
Ark.-N. La.-E. Tex.	184	— 4	+ 25
Oklahoma	291	—20	+ 8
Kansas-S. Nebraska	193	— 2	+ 35
Illinois-Eastern	144	—22	+ 3
Rocky Mountains	191	— 5	+ 58
Pacific Coast	176	+ 5	+ 42
Total U. S.	2,876	—42	+485
Western Canada	154	+ 2	+ 46
Total	3,030	—40	+531

*Courtesy of Hughes Tool Co. Trends in drilling activity in the United States and the Gulf Coast and Arkansas-North Louisiana-E. Texas areas are shown on pages 130 and 131.

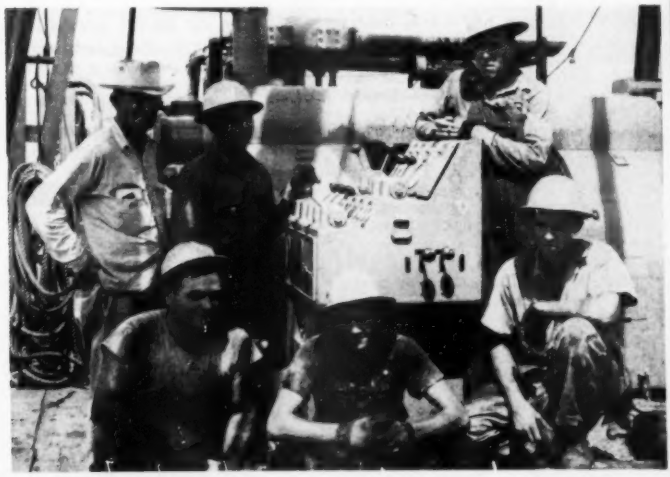
Most substantial declines in activity were in Oklahoma and the Illinois-Eastern areas. In contrast, there was an increase in drilling on the Gulf Coast, boosting the number of rigs in that area to a new record level of 658. The Pacific Coast and western Canada areas also reported increases. The over-all total was 531 greater than at the same time a year ago.

Drillers Plan Meeting

Tentative plans already are being initiated for the next annual convention, the twelfth, of the American Association of Oilwell Drilling Contractors. The convention will be held at Oklahoma City September 28-30, 1952, with headquarters at the Skirvin Hotel.

Roy R. Powers is the contractor on a new operation being started by Black Oil Co. in the Terlton area, in Pawnee County, Oklahoma. Location is for 1-A Ferguson, in the NE NW SW 26-20n-7e.

Black Hills Drilling Co., Newcastle, Wyo., has the contract for Union Sulphur & Oil Corp.'s first drilling venture in the Rocky Mountain region. The test, 1 Crom, is located in the NE SW SW 15-39n-61w, in the Northeast Bridge Creek area, Niobrara County, Wyoming. Contract calls for



On the floor of a large workover rig recently assembled by Pure Oil Co. on the Texas Gulf Coast and now operating in Galveston County. Standing, left to right: Teddy Klug (rotary tool foreman), George Tony (driller), and Benny G. Thomas. Front row, same order: John Faulk, Jake Warner, and Chase Sutton.

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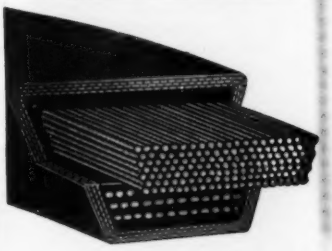

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Tippett Drilling Co. is the contractor on a projected 3,400-ft. test being drilled by Hunt Oil Co. at 1 Lacy, 9-14n-8w, 3 miles southwest of Castor, in Bienville Parish, northwestern Louisiana.

McConnell Drilling Corp., Farmington, N. M., has moved a heavy-duty rotary rig to the Foster Gulch area, Big Horn County, Wyoming, for a 9,865-ft. Madison lime test to be drilled for The Texas Co. at 1 Unit, C NW SW 6-54n-96w.

Wofford Drilling Co., Tulsa, is drilling for K. A. Ellison and associates at a wildcat location 7 miles northeast of Newkirk, northeastern Kay County, Oklahoma. Location is on the operator's Bain lease, in the NE NE SW 4-28n-4e.

Strain Drilling Co., Hays, Kans., has a rig running for Earl Cave at a wildcat location in the Irvin area, 6 miles west of Hays, in western Ellis County, Kansas. Location is at 1 Bemis, SE SE NE 32-13-19.

Montgomery Drilling Co., El Dorado, Ark., is starting another American Liberty Oil Co. operation in the South Big Creek field, Franklin Parish, eastern Louisiana. The new well, a Tuscaloosa test, is 4 Morgan, in 17-16n-8e.

Warren & Bradshaw Drilling Co., Tulsa, is drilling for The Texas Co. at the latter's 1 Cline, a wildcat test in the SE SE NW 28-27n-6w, southwest of Medford, in Grant County, northern Oklahoma.

B. A. Wilkinson has a new Paluxy test under way for McDowell & Cook and associates in the old Vivian field, Caddo Parish, northwestern Louisiana. Current operation is 3 Parker, in 14-22n-16w.

Dee Ray is the contractor on the wildcat test which P. R. Harman is drilling in the Belle Fourche River area, Butte County, South Dakota. The test is 1 Olson. Location is in the NW NE NE 27-9n-3e.

Black Hills Drilling Co., Newcastle, Wyo., has contracted for a wildcat test to be drilled for McCauley & Dorough at 1 Government-Smith, in the NE SW SE 5-43n-65w, in the Clareton area, Weston County, Wyoming.

Harper & Turner Drilling Co., Oklahoma City, is drilling for Ashland Oil & Refining Co. at 1 Moore, C SE NE 1-14n-3w, northern Oklahoma County, Oklahoma. Location is just south of the Logan County line in the area north of the North Edmond pool and west of the Southeast Waterloo pool.

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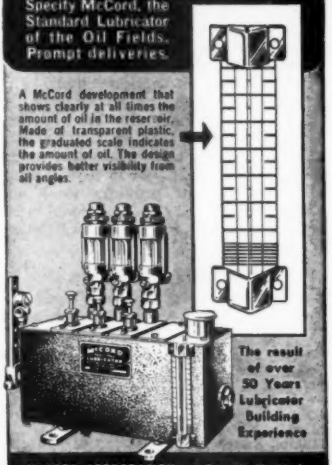

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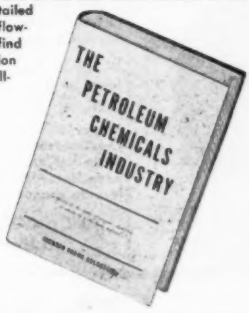

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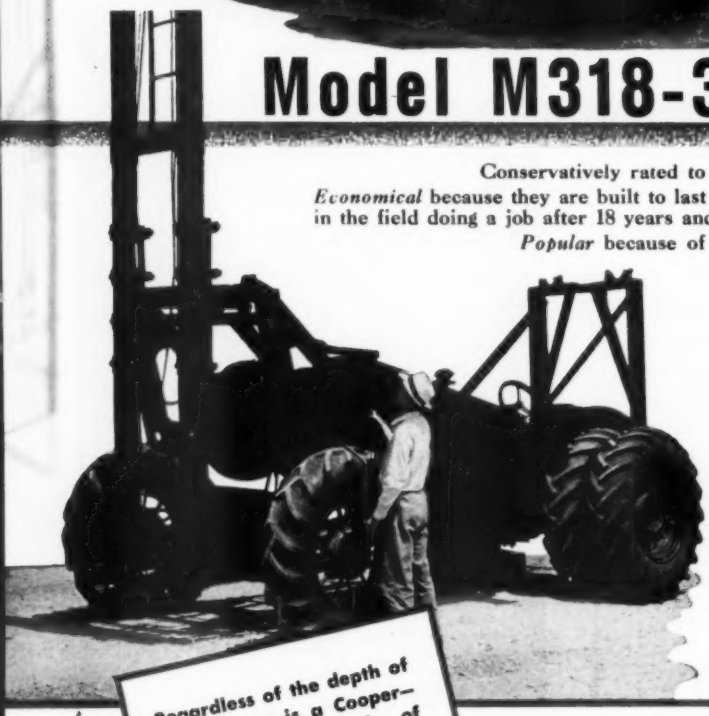

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REPORTS ON

Exploration and Drilling

Mississippi Delta Area

DEVELOPMENT of the oil and gas fields in the marshes of the Mississippi River Delta is a unique operation from the initial exploratory work through the drilling of a well, but despite the problems encountered some of Louisiana's largest oil fields are being developed here.

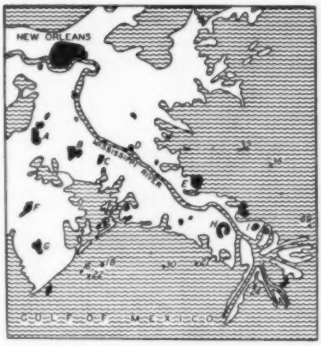
On the map a few of these fields are keyed: (A) Delta Farms, (B) Lafitte, (C) Lake Hermitage, (D) Point a la Hache, (E) Quarantine Bay, (F) Golden Meadows, (G) Leeville, (H) Venice, and (I) Romere Pass.

All of the fields on the delta produce from Miocene-age sand traps resulting from movements caused by deep-seated or piercement-type salt domes. These domes were located by geophysical means with detailed seismograph work following reconnaissance seismograph and gravimeter surveys. Geophysical work on the delta is carried out by using marsh buggies, since the only high and dry land is located along the edges of streams which have built up natural levees.

Drilling on the delta is done from barges that are moved on and off location through man-dredged channels that cut across the marshes between the natural water courses. The dredged channel at Venice field circles the salt dome like a tremendous cogwheel with the cogs being the dredged slips for drilling barges on location.

From the interpretation of subsurface studies and geophysical surveys, it has long been recognized by geologists that the thick late-Tertiary sediments out under the waters of the Gulf of Mexico off the southern coast of Louisiana should have sand development comparable to that found by wells on the delta for at least as far as 25 miles from shore and also that traps forming salt domes are present out the same distance.

The first truly offshore discovery in the Gulf of Mexico was made in 1947 (Ship Shoal Block 32 to the west of the mapped area). During the following year seven discoveries were made in the open waters of the gulf. In 1949 there were 13 offshore discoveries but only 3 in 1950, when the controversy between the federal and state governments over ownership of the tidelands had begun to hint at what was to come.



The offshore discoveries within the limits of the map are keyed by block numbers: Grand Island Block 16, 18, and 22; West Delta Block 27 and 30; South Pass Block 24; Main Pass Block 69; Breton Sound Block 32 and 36. Bay Marchand field, the southwesternmost field on the map, is over one of the largest piercement salt masses yet found. This dome, with top of salt at 2,100 ft., measures roughly 4 miles in diameter. The field produces from upper Miocene sands at 2,800-5,200 ft.

The 24 offshore oil and gas fields are considered by some well-informed geologists to have proved as much at 40,000 sq. miles of the Continental Shelf as oil country*. However, despite this optimistic picture, since the completion of the last well started prior to the federal Government's order to stop all new offshore drilling nearly 1 year ago, this oil province has seen no development activity. The enormous amount of equipment needed for offshore drilling is tied up. Even geophysical exploratory activity is running at but a small portion of what it was back in 1947-48, when the industry started to turn what it recognized as potential oil country into a producing province.

Oil companies interested in the tidelands are waiting helplessly and frustrated.

They expect to have to wait at least another year for whatever is going to happen—just what that will be remains to be seen. They are wasting precious time as well as investment through no fault of their own during a period when time is of the essence.

Philip C. Ingalls.

*American Association of Petroleum Geologists Future Oil Provinces of North America.

An hour's flight over this oil-rich country with Gordon Atwater, New Orleans consulting geologist, as "guide" was provided for a fortunate few of the registrants at the Gulf Coast Association of Geological Societies' New Orleans meeting, November 15-17, in a Pan-Am Southern Corp. plane.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

WEST TEXAS.—Reagan County gained a new pool in the lower Spraberry at Barnhart 1-13 Patterson which completed for 335 bbl. of oil; later the well gaged better than 400 bbl. of oil in 10 hours. Standard of Texas 1-3 Mittell, third well in West Nueva field of Schleicher County, completed for 1,291 bbl. of oil a day.

NORTH TEXAS.—E. K. & E. M. Burt 3 Swenson, shallow wildcat 1½ miles northwest of Stamford in Haskell County, flowed 315 bbl. of oil in 3 hours, ¾-in. choke, from Swastika pay around 2,500 ft.

ROCKY MOUNTAIN AREA.—A new Williston Basin wildcat has found oil on tests. The Texas Co.'s Cedar Creek, Dawson County, Montana, well made small amounts of oil on drill-stem tests of the Ordovician (?). Stanolind Oil & Gas Co.-Continental Oil Co. tested oil in the Tensleep at the North Fork, Wyoming, wildcat, for an apparent discovery. Byrd-Frost, Inc., has completed the Ferron sand gas discovery in the Clear Creek area, Carbon County, Utah.

MISSISSIPPI.—M. N. McCaskill 1 J. T. Sanders, 22-15s-6e, blew out making gas while operator was cleaning out an old well around 2,900 ft. Importance of this well is not based on its potential, but upon the fact that it may open the "hard rock" country of the northeastern part of the state.

Southwest Texas

Bandera County Wildcat Encounters Shows, Porosity

CORPUS CHRISTI—Although official information is still being closely guarded on Mikton Oil Co. 1 Stelzer, Bandera County wildcat, reports continue to leak out on this interesting venture. Originally projected to 8,500 ft., it is believed that operator will discontinue drilling at or around 5,500 ft. and attempt completion.

Well was cored for several hundred feet, indicating that a sand section of considerable thickness was encountered. It is believed that the well will be completed on pump. Although the wildcat has not been classified as a new oil-field discovery, the important factor is that the well has encountered sand with oil shows and porosity to prove existence of probable Pennsylvanian production in the Lower Edwards Plateau.

A new oil pay has been opened in Alta Verde field, Brooks at Howeth & Mason 1 Mrs. Emily McLeod. From perforations at 2,186-92 ft., the well pumped 55 bbl. of 28°-gravity oil daily to open the shallowest oil production in the field.

Final gage has been run on a new oil discovery in Copano Bay, 1¼ miles northwest of West Fulton Beach field at C. G. Glasscock and Pontiac Refining Co. 1 State Tract 48. From perforations at 6,295-6,305 ft., the well flowed 127 bbl. of oil daily through ½-in. choke. Tubing pressure registered 1,280 psi. The well lies across a fault from production in Copano Bay.

Second well in the new Borregas Creek field, Wilson County, has been completed in a new pay. Martin, Shelly, Thomas, Wise, McCabe and Olmos 2 Kate Higgins flowed 438 bbl. of oil daily from Buda lime at 5,703-38 ft. Hole is bottomed at 6,004 ft. and plugged back to 5,770 ft. Operator acidizied with 2,500 to 3,000 gal. for completion. The discovery well for this area, 1 Kate Higgins, was completed for 328 bbl. of oil daily from open hole in Austin chalk at 5,590-5,632 ft. Top of crevice was found in this well at 5,632 ft. The 2 Higgins is definitely not in a crevice.

The Chicago Corp. 16 Slick Estate, wildcat 12 miles north of Sullivan City in Starr County, has been completed for 6,400,000 cu. ft. of gas daily on open flow. Perforations were effected at 4,761-64 ft. for completion.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Brooks County: New pay at Alta Verde—Howeth & Mason 1 Mrs. Emily McLeod, S. Alacon Sur. 312, TD 3,894 ft., perf. 2,186-92 ft., IP: 55 bbl. oil per day on pump, 28° gravity.

Frio County: Oil discovery—George W. Graham 1 T. P. Nowlin, John W. Crawford Sur., A-1080, TD 3,475 ft., open hole 3,410-75 ft., IP: 22 bbl. oil per day.

Gonzales County: Oil discovery—O. Neathery, Jr., 1 Stulting, Robert Kelly Sur., A-307, TD 2,046 ft., Carrizo - Wilcox 2,036-46 ft., IP: 35 bbl. oil per day, 9/64-in. choke, 21.8° gravity, CP 600 psi., TP 300 psi.

Hidalgo County: Gas-condensate discovery Continental Oil Co. 2 P. H. Longoria, et al, Share 7-A, San Ramon Grant, A-62, TD 8,950 ft., perf. 8,837-42 ft., IP: 146 bbl. condensate per day, 3/16-in. choke.

Jim Hogg County: Oil discovery—H. L. Hunt 1 Lawrence R. Brooks, Santo Domingo de Abajo Grant, Block 6, TD 4,721 ft., perf. 3,673-77 ft., IP: 146 bbl. oil per day, ¾-in. choke, 48° gravity.

Jim Wells County: Oil discovery—Barron Kidd 1 M. E. Dilworth, S. A. & M. G. RR Sur. 87, TD 5,084 ft., perf. 5,018-23 ft., IP: 52 bbl. oil per day, 9/64-in. choke, 41.4° gravity.

Nueces County: Gas-condensate discovery—Sam E. Wilson, Jr., and Renwar Oil Corp. 1 State of Texas Tract 462-A, Corpus Christi Bay State Tract 462-A, TD 10,718 ft., perf. 8,453-55 ft., IP: 75 bbl. condensate per day, 59° gravity.

Starr County: Gas discovery—The Chicago Corp. 16 Slick Estate, Los Maguelles Grant, 12 mi. N of Sullivan City, TD 5,000 ft., perf. 4,761-64 ft., IP: 6,400,000 cu. ft. of gas per day.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Aransas County: Union Producing Co. 5 Tatton, John Durst Sur., A-51, dry, TD 10,340 ft.

Bastrop County: Thomas Jordan, Inc., 1 H. H. Jones and J. W. Hansard, S. M. Williams Sur., dry, TD 3,193 ft.

Bell County: W. R. Zanes, Jr., 2 fee, David Sanches Sur., dry, TD 3,125 ft.

Bexar County: Robert Ross 1 Fritz Schirmer, Sam C. McCullough Sur., dry, TD 783 ft.

Guadalupe County: W. F. Dolgener 1 Frank Schmidt, Robert Smith Sur., dry, TD 2,256 ft.

Hidalgo County: Hugo Allen B-1 Helen E. Stegle Community, Las Mestenas Grant, Sec. 88, Block 9, dry, TD 8,252 ft.

Jim Hogg County: O. W. Killam 1 Gutierrez, Charco Redondo Grant, dry, TD 3,546 ft.

LaGloria Corp. 1 C. H. Hellen, Duval County School Land Sur., A-365, dry, TD 3,240 ft.

Jim Wells County: Salt Dome Production Co. 1 Juanita R. Gonzales, et al, F. W. Shaeffer Sur., Sec. 94, A-426, dry, TD 5,511 ft.

Lone Star Producing Co. 1 Ruth Taylor, I&GN RR Sec. 31, dry, TD 6,750 ft.

McMullen County: W. W. Carter 1 Ralph Franklin Sur., A-1069, dry, TD 5,853 ft.

Newman Bros. Drilling Co. and Alaska Steamship Co. 1 South Texas Syndicate, James Fitzpatrick Sur., A-759, Sec. 14, dry, TD 5,853 ft.

Nueces County: Sam E. Wilson, Jr., et al, James W. Waterbury Sur., A-408, dry, TD 8,525 ft.

San Patricio County: C. G. Glasscock 1 G.

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Floerke, Orig. Subd. of Taft Farm Lands, dry, TD 8,741 ft.

Starr County: Dulaney Oil Co., et al 3, Mary S. Thomas, Porc. 103, dry, TD 1,650 ft.

Travis County: B. & S. Drilling Co., Inc., 1 Maggie Burleson, James Gilleland Sur., dry, TD 1,550 ft.

Webb County: Killam & Hurd, Inc., et al, 2 J. O. Walker, Sur. 1011, 4 mi. N of Oilton, dry, TD 1,618 ft.

Paisano Trading Co., Ltd., 1 John M. Martin Estate, H. H. Henson Sur. 86, dry, TD 6,632 ft.

Williamson County: J. P. Bristow & Co. 1 Safford & Herndon, M. F. de Graffenreid 109 Sur., dry, TD 1,119 ft.

Zapata County: Pontiac Refining Co. A-1 Somerset Land & Cattle Co., Jose Vasquez Borego Grant, A-209, dry, TD 8,020 ft.

North Central Texas

Clay County Well Completes For 52 Bbl. of Oil on Pump

WICHITA FALLS.—Week's developments included a number of discoveries or extensions and new pays in older areas.

In Clay County, 1 mile southwest of Blue Grove, B. L. Woolley 1 E. F. Galloway, was ready for completion after pumping 52 bbl. of 44°-gravity oil a day from pay at 5,986-6,026 ft.

Frank Wood Associates, Ltd., 1 L. L. Kerr, Clay County test 5 miles north of Bluegrove, kicked off and flowed at the rate of 10 bbl. of oil an hour after treating with 3,000 gal. of acid through perforations at 6,121-34 ft. Total depth was 6,694 ft. in the Ellenburger. Well was plugged back to the Caddo.

In Nolan County, Union Oil Co. 1 TXL, 33-X-T&P, found shows of oil in Pennsylvanian reef. Top of the reef was 5,985 ft., and a 1-hour test between 5,987-6,010 ft. developed some gas, 60 ft. of gas-cut mud, 240 ft. of oil and gas-cut mud, and 475 ft. of salt water. According to reports, further testing was to be done in the Canyon sand, which had oil shows while drilling.

F. Kirk Johnson 1 Bettie Allen, northeast of Rusmag field in Jack County, found pay in the conglomerate from 4,563-4,606 ft. On production test, the well flowed 176 bbl. of 40°-gravity oil a day through 16/64-in. choke. Tubing pressure was 200 psi.

In Archer County, Russell Maguire 1 Hulse, 8 miles northeast of Megargel, recovered 130 ft. of heavily oil-cut mud and 10 ft. of free oil on a 2-hour test from 4,849-4,923 ft. It was drilled ahead to the Mississippian at 5,060 ft. and set casing at that point.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Coleman County: E. B. Fletcher 1 J. M. Futrell, Sec. 4, T&NO Sur., TD 3,378 ft., elev. 1,985 ft., perf. 3,348-54 ft., flowed 89 bbl. 43°-gravity oil, 10/64-in. choke, TP 700 psi., GOR 450 cu. ft.

Eastland County: D. E. Hughes 1 B. A. Danley, Mary Fury Sur., TD 3,612 ft., elev. 1,584 ft., pay sand 3,592 ft., pumped 23 bbl. 45°-gravity oil.

Haynes B. Ownby Drilling Co. 1 Mrs. Effie Brown, 110-3-H&TC, TD 3,974 ft., elev. 1,060 ft., pay 3,700 ft., flowed 78 bbl. oil a day, 13/64-in. choke.

Haskell County: E. K. & E. M. Burt 3 Swenson Bros., 13-1-BBB&C, TD 2,982 ft., Swastika 2,450-2,520 ft., flowed 315 bbl. 42°-gravity oil, 3 hr., ¾-in. choke, TP 200 psi., GOR 560 cu. ft.

Stanolind Oil & Gas Co. 1 J. H. Dabney, Sec. 234, McAfee Sur., A-898, and J. Williams Sur., A-673, TD 6,096 ft., elev. 1,608 ft., perf. Strawn sand 4,845-49 ft., pumped 34.5 bbl. of 32°-gravity oil.

Jack County: Bolin Oil Co. 2 O. Loving, Blk. 2,776 ft., TE&L Sur., TD 2,147 ft., pay 2,135 ft., pumped 54 bbl. 38°-gravity oil.

Neeld & Hood Drilling Co. 1 H. O. Prideaux, SPRR Sur., A-577, TD 3,615 ft.,

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pay 3,594 ft., flowed 181 bbl. 41°-gravity oil, 20/64-in. choke, TP 120 psi., GOR 300 cu. ft.

Taylor County: Pan American Producing Co. 1-9 W. R. Matthews, Sec. 38, Comanche Indian Reservation Sur., TD 1,027 ft., pay 1,021 ft., pumped 18 bbl. 37°-gravity oil.

Throckmorton County: P-M Drilling Co. 1 R. Davis, Sec. 3,004, TE&L Sur., TD 4,201 ft., elev. 1,284 ft., Caddo pay 4,190 ft., flowed 782 bbl. 40°-gravity oil, 14/64-in. choke, GOR 650 cu. ft.

Wilbarger County: Johnson & Johnson 3 R. L. Castlebury, 66-14-H&TC, TD 1,527 ft., pay 1,506 ft., pumped 24 bbl. 34°-gravity oil.

Young County: Lebus Bros. 1 C. W. Johnson, Blk. 4, A-253, Sargent Sur., TD 3,582 ft., pay 3,570 ft., pumped 15.5 bbl. 40°-gravity oil.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: G. W. Cooper 1 E. A. Jentsch, John Scott Sur., dry, TD 4,821 ft.

W. J. and John J. Moran 1 Jeske, BBB&C Sur., A-826, dry, TD 5,306 ft.

Ben F. Schultz Co. 1 Allen, Sec. 18, W. E. Probert Sur., dry, TD 1,503 ft., Gunsite 1,437 ft.

Brown County: S. S. Thomas 1 W. N. Cason, Sec. 34, HT&B Sur., dry, TD 1,678 ft.

T. L. Williams 1 Lizzie Furry, Mahala Duncan Sur. 55, dry, TD 2,828 ft., elev. 1,515 ft., Caddo 1,961 ft., Marble Falls 2,641 ft.

Clay County: Bridwell Oil Co. 1 Robert R. Brown, Blk. 91, J. H. Belcher Subd., dry, TD 4,600 ft.

Warren Oil Corp. 1 Bowen est., Sec. 2,640, TE&L Sur., dry, TD 5,116 ft.

Cooke County: Goodpaster Drilling Co. 1 J. M. Weinsapfel, MEP&P Sur., A-769, dry, TD 1,982 ft.

Scott Bros. 1 T. Trubenback, Blk. 16, A. Stutsmen Sur., dry, TD 3,306 ft.

Eastland County: Cooper & Hemphill 3 M. A. Clyatt, 31-4-H&TC, dry, TD 1,539 ft.

W. W. Whiteman 1 M. P. Ramsey, 9-2-BBB&C, dry, TD 3,695 ft., elev. 1,661 ft., Caddo 3,208 ft., Lake sand 3,660 ft.

Jack County: F. Kirk Johnson 1 S. M. Garrison, WCRR Sur., A-906, dry, TD 4,800 ft.

Lone Star Producing Co. 1 Eula May Craft, Halmark Sur., A-252, dry, TD 5,840 ft.

W. T. Waggoner est. 1 R. H. Thompson, E. Ryder Sur., A-1,172, dry, TD 5,735 ft., Barnett 5,412 ft., dolomite 5,635 ft.

Jones County: Blackwell Oil & Gas Co. 1 Rufus Herbst, 4-338-Austin & Williams Sur., dry, TD 3,397 ft.

B. G. Byars 1 C. J. Hill, 9-2-T&NO, dry, TD 2,672 ft., elev. 1,130 ft., Gunsite 2,455 ft., Swastika 2,582 ft.

Hedrick Oil Co. 2 J. P. Howle, 17-16-T&P, dry, TD 2,220 ft.

S. B. Roberts 2 J. I. Milsap, Harrison CSL, Sur. 333, dry, TD 3,442 ft.

Montague County: A. V. Grant 1 B. D. Franklin, E. A. Maynard Sur., dry, TD 4,155 ft.

Palo Pinto County: J. P. Logan 1 R. B. Hinkson, 71-3-T&P, dry, TD 4,360 ft., Marble Falls 3,965 ft.

Stephens County: Marshall Pipe & Supply Co. 2 D. C. Pratt, 48-6-T&P, dry, TD 2,000 ft.

The Texas Co. 5 H. E. Wilson, TE&L Sur., dry, TD 4,490 ft., Marble Falls 3,985 ft., Chappel 4,302 ft., Ellenburger 4,340 ft.

Taylor County: Ray Oil Co. 1-B E. L. Young, 26-64-H&TC, dry, TD 4,983 ft.

Wise County: Continental Oil Co. 1 D. W. Newsom, G. H. Duncan Sur., A-240, dry, TD 6,553 ft., elev. 1,016 ft., Caddo 4,245 ft., Ellenburger 6,276 ft.

Young County: Bridwell Oil Co. 1 Mrs. S. E. Snider, R. Wilson Sur., A-1,276, dry, TD 4,745 ft., Caddo 4,500 ft.

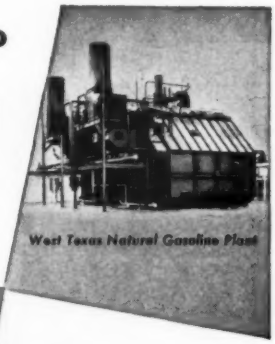
R. W. Darden Trust 2 Barnett, Blk. 186, TE&L Sur., dry, TD 1,114 ft.

L. A. Helms 1 Pete Reynolds, J. Billingsley Sur., dry, TD 1,000 ft.

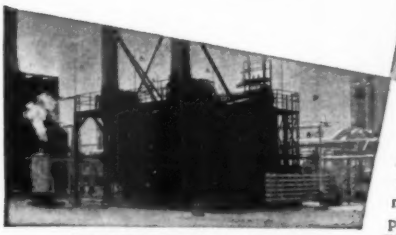
E. H. Remington 1 C. J. Taack, TE&L Sur., Sec. 264, dry, TD 800 ft.

WICKES

STEAM GENERATORS SPEED PROCESSING AND CUT COSTS IN REFINERIES AND NATURAL GASOLINE PLANTS



West Texas Natural Gasoline Plant



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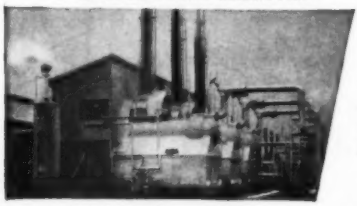
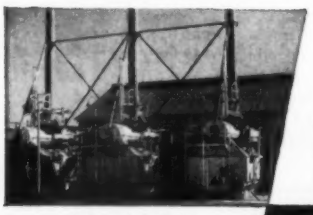


Louisiana Refinery



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California

Operators Drilling 25 Per Cent More Wells This year

LOS ANGELES.—California operators this year will drill about 25 per cent more wells than they did last year, if they maintain their present pace over the next few weeks. To date they have completed 2,058 wells as compared with 1,829 in all of 1950. With new locations and completions continuing to hold in the range of 40 to 50 weekly, it appears likely that this year's total will be about 2,300 wells.

Renewal of development at San Ardo, Monterey County, has been a substantial factor in the increased drilling activity. There in the second half of the year 100 new oil producers have been added, and others are continuing to be completed at a rate just short of one daily. All of this activity is being carried on by two companies, The Texas Co. and Jergins Oil Co.

Standard Oil Co. of California has staked location for a ¼-mile northeast extension on the field's east flank. The step-out will be B 6-5 Alexander in SW NW Section 5-23s-11e. Superior Oil Co.'s six producers in Section 6 all failed to find the field's main pay (the Lombardi zone) and were completed in the slightly deeper Aurignac zone.

Jergins Oil Co.'s 1 McCool in Section 26-22s-10e at San Ardo was dry. This wildcat, dry at 2,478 ft., was drilled about 1 mile northeast of production in the Lombardi area.

At Pleito Creek on the southeast end of San Joaquin Valley in Kern County, Humble Oil & Refining Co. was below 4,000 ft. on its third well in the field it discovered last spring. The pool opener, 1-B Kern

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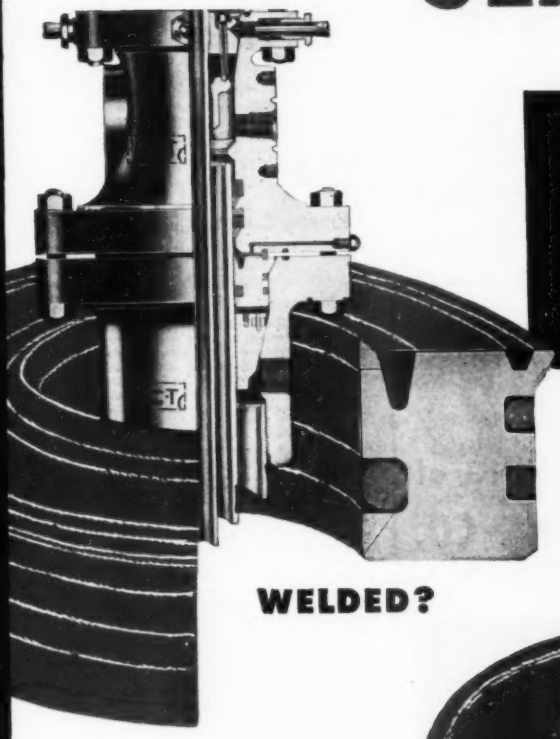

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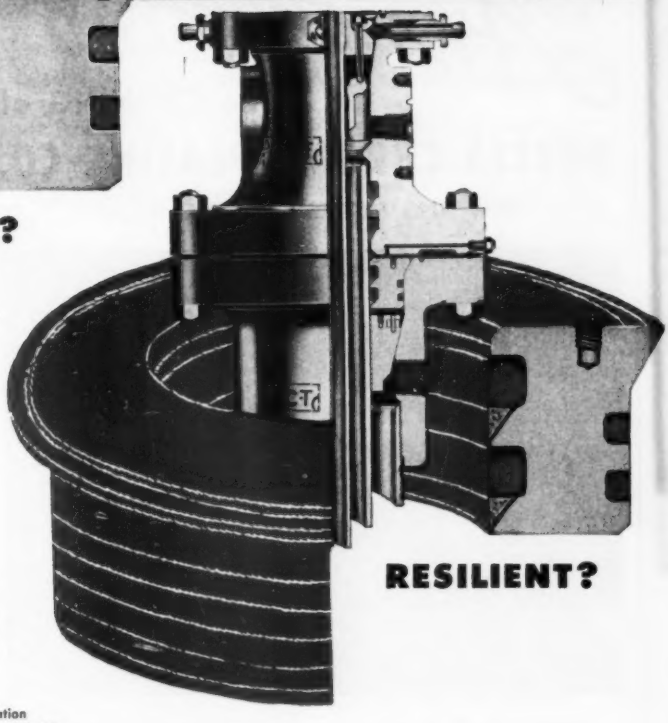

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The "C-18-H" model features an automatic floating seal. This seal uses the application of oversize Hycar "O" rings on the outside and inside of the hanger backed up by non-extrusion rings to automatically seal off any pressure in the annular space between the pipe and the I.D. of the casing head.

The "C-18-HW" provides a metal to metal seal. A restricted API metal ring gasket between the welded element and the next head exerts the correct pressure on the ground seat of the casing head to form a perfect metal to metal seal. The "O" ring on the inside diameter of the welding element and below the weld acts as a secondary seal, providing added protection while the weld is being applied.

Both models of the O-C-T "C-18" series gives you an economical, dependable hanger, and bring important new features of safety and ease of installation.

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County Land in NE NW Section 35-11n-27w, was completed as a 25-bbl. pumper in the Santa Margarita at 4,200 ft. The second well flowed only gas. Locations for three additional tests have been staked by Humble, all in Section 35.

Among the new wildcats announced were two wells in the Edison area southeast of Bakersfield. United Exploration Co. and Golden Gate Petroleum Co. started 1 Mettler in Section 25-30s-29e about ½ mile east of Edison field. Between Edison Groves and Race Track Hill production in Section 33-29s-29e, Kern Oil Co. staked 1-2 Portals.

About 5 miles west of Calexico and just north of the Mexican border, The Texas Co. was below 6,200 ft. at its Imperial Valley wildcat, 1 Jacobs NCT-1. Scouts report the well as yet had not encountered any oil shows. The company plans to drill several additional wildcats in the valley during the next year.

Another rank wildcat, which has been under way for almost a year, was nearing 8,000 ft. after starting from a surface elevation of 6,800 ft. This was Standard of California 1 Hattie Russell in the remote Reyes Peak area of Ventura County.

CALIFORNIA SUCCESSFUL WILDCAT

Kern County, Arvin field, 1 mile northwest extension: The Texas Co. 1 Kern Valley, SE NE 15-31s-29e, IP pumped 19 bbl., perf. 6,278-6,320 ft., 32° gravity, 2 per cent cut. TD 6,462 ft., plugged back to 6,320 ft., elev. 466 ft.

CALIFORNIA WILDCAT FAILURES

Fresno County, Coalinga area: Humble Oil & Refining Co. C-1 South Pacific Co., 23-18s-15e, dry, TD 10,400 ft., elev. 526 ft.

Jennings & Reese 2 Chevalier, 12-21s-14e, dry, TD 1,274 ft., elev. 1,100 ft.

Jacalitos area: Signal Oil & Gas Co. 2 Signal-Camino, 31-21s-15e, dry, TD 4,436 ft., elev. 1,059 ft.

Kern County, Beer Nose area: Steele Petroleum Co. 1 Beer Nose, 6-26s-19e, dry, TD 2,858 ft., elev. 613 ft.

Poso Creek area: Cannon Drilling Co. 2 Sally, 20-27s-27e, dry, TD 1,981 ft., elev. 666 ft.

Monterey County, San Ardo area: Jergins Oil Co. 1-26 McCool, 26-22s-10e, dry, TD 2,478 ft., elev. 762 ft.

San Bernardino County, Chino area: Southern California Petroleum Corp. 1 Marcell-Downs, 31-2s-8w, dry, TD 1,810 ft., elev. 1,310 ft.

Chino Hills area: Chino Exploration Co. 1 Caspary, 5-3s-8w, dry, TD 1,815 ft., elev. 1,200 ft.

Santa Barbara County, Cuyama Valley area: A. A. Cameron 1 James Wilson, 16-10n-27w, dry, TD 5,518 ft., elev. 2,235 ft.

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Mississippi

Monroe County's New Gasser May Open "Hard Rock" Area

JACKSON.—Mississippi's new gas discovery in Monroe County, M. N. McCaskill 1 J. T. Sanders, 22-15s-6e, is being flowed into pits through a ¾-in. choke and flared. This wildcat came in blowing gas while operators were cleaning out an old abandoned stratigraphic test around 2,900 ft. The gas is believed to be coming from a horizon or horizons much deeper than 2,900 ft.

The well was originally drilled by Carter Oil Co. and abandoned at total depth of 6,060 ft. in Tuscumbia. Electric log was run to 5,929 ft. and only 1 core was cut in the well. It was abandoned in November 1941. During the 10 years since the well was originally completed, it is possible that some of the tight sands in the Mississippian section could have given up enough gas to heavily charge a permeable section up the hole.

No gage of the volume of gas or pressure has been made. Most estimates are that the well is making 8,000,000 to 10,000,000 cu. ft. with approximately 500 psi. flowing pressure. Several samples of condensate were collected which tested from 54° to 59.9° gravity.

This wildcat is viewed by many as the most important discovery to date in Mississippi. Although the potential of the well is not so large as that of other gassers in the state, it is believed that it will open the "hard rock" country of the northern and northeastern part of the state.

Final completion has been made on Hunt Oil Co. 1 U. S. A., 20-5n-2e, new Wilcox oil discovery in Franklin County, Mississippi. Through perforations at 6,465-69 ft., the well flowed 100 bbl. of oil daily through ¼-in. choke under tubing pressure of 370 psi., and casing pressure 510 psi. This wildcat was drilled to total depth of 11,200 ft. to test the Lower Tuscaloosa section, and plugged back to test the Wilcox. Shows were reported at 6,465-74 ft. and 4,773-76 ft. The field has been named "Knoxville Tower."

In northeastern Wilkinson County, Max B. Andrea-L. Cashion Co. 1 Hazlip, et al, 10-4n-1e, is still having completion troubles. On drill-stem test of perforations at 6,456-58½ ft., recovery was mud, salt water, acid, and a little water cut with 10 per cent oil. Operators are preparing to test another zone which carried oil shows.

MISSISSIPPI SUCCESSFUL WILDCAT

Franklin County: Oil discovery "Knoxville Tower"—Hunt Oil Co. 1 U. S. A., 20-5n-2e, TD 11,190 ft., Wilcox 6,465-69 ft., IP: 100 bbl. oil per day, ¼-in. choke, TP 370 psi., CP 510 psi.

MISSISSIPPI WILDCAT FAILURES

Adams County: Hunter Jones 1 Joseph W. Parker, 5-3n-4w, dry, TD 8,038 ft.

Covington County: Cities Service Oil Co. 1 Whitten Bullock, 28-7n-15w, dry, TD 9,513 ft.

Jefferson County: B. Serio 1 Mrs. Kate Brumfield, 32-10n-1e, dry, TD 6,505 ft.

Wayne County: Walter E. Sistrunk 1 T. W. Braddock, 10-6n-9w, dry, TD 6,709 ft.

Oklahoma

Joins Sand Produces in South Moore Discovery

ANOTHER area in the central part of the state has been proved productive in the lower Simpson section. This time, it is the South Moore pool, in Cleveland County, where Mid-Continent Petroleum Corp. has completed its 1 Westermier, NE SW SW 26-10n-3w, in the Joins sand, opposite which casing is perforated at 5,578-94 ft. The well flowed 344 bbl. of oil in a 6-hour test through 1-in. choke; then flowed 204 bbl. in 9 hours through 24/64-in. choke; and on a later test was flowing at an average rate of 40 bbl. per hour. Gravity of the oil is 38°. Hole was carried to a total depth of 9,630 ft. in the pay and casing run through the zone to 9,628 ft.

This well was completed originally as the discovery producer of the pool in Wilcox sand at a total depth of 8,900 ft. It is one of several old Wilcox sand producers in several Cleveland County pools which have been deepend through the lower Simpson series and found production. McLish sand, tested at 9,276-95 ft., carried salt water.

The Texas Co. has completed its shallow McLish sand discovery well, 1 Chapman, SW NW SE 35-4s-4e, 2 miles northeast of Madill, in Marshall County, southern Oklahoma. Casing is perforated opposite two intervals, 924-28 ft. and 940-50 ft. On a late gage, the well produced 148 bbl. of oil in 10 hours. Hole was drilled to 3,048 ft. in Arbuckle lime, and then plugged back to 965 ft. It previously had been cased to 1,032 ft. with 9⅝-in. pipe. Operators are starting 2 Chapman, a location north of the discovery.

Blackwell Oil & Gas Co. 1 Gerrish, NE NE SE 20-18n-1e, new Wilcox sand discovery well in western Payne County, flowed at an average rate of 58 bbl. of oil per hour for 7 hours. Pay zone is open below 5,205 ft. to a total depth of 5,226 ft. Drilling already is under way at an east offset, 1 Stewart, NW NW SW 21-18n-1e. The area is 2 miles northwest of the Southeast Paradise pool, which produces from Bartlesville sand.

Mid-Continent Petroleum Corp. has a good Hunton lime well in the area between Fitts and North Fitts pools, in Pontotoc County. Its 1 Sallee, SE NW NW 20-2n-7e, the first new development in that general area in several years, flowed 150 bbl. of oil in 24 hours through 3/16-in. choke. Casing is perforated opposite an interval at 4,207-28 ft. Total depth is 4,560 ft. with casing at 4,553 ft. Production of the North Fitts pool, ½ mile to the north, is from sands at depths of from 1,600 to 1,700 ft. Nearest wells in the Fitts pool, ¾ mile to the south, produce from the Viola and Simpson pays.

A Misener sand oil discovery appears to have been made ½ mile northwest of gas production of the Southwest Gilcrease field, Hughes County, where Davidor & Davidor got a good flow of clean oil in a drill-stem test at their 1 Rogers, SW SW NE 24-9n-8e. Top of the sand was checked at 3,998 ft. Test was made of an interval at 4,002-07 ft. In the test, gas flowed in 5 minutes. Oil was at the top in 2 hours. Flow pressure was 300 psi. Total depth is 4,008 ft. Casing has been run to 3,996 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Carter County: Merrick et al 1 Brown, NE NE SE 8-5s-1w, 84 bbl. 34.6°-gravity oil from sand at 4,184-90 ft., TD 4,509 ft., W. Brock field extension.

Cleveland County: Sinclair Oil & Gas Co. 5 Community Franklin "A," C NE SE 21-10n-2w, 412 bbl. 38°-gravity oil from basal McLish at 7,639-99 ft., TD 8,295 ft., Moore field new pay.

Noble County: Bay Petroleum Co. 1 Bolzinger, NW NW NW 18-21n-1w, 60 bbl. 42°-gravity oil from Avant at 3,374-94 ft., TD 5,098 ft. No. Sams field new pay and extension.

Okfuskee County: Skelly Oil Co. 1 Tiger, SW SE NW 12-12n-8e, 127 bbl. oil from Gilcrease at 3,304-10 ft., TD 4,107 ft., OWWO, SE Valley Grove field new pay.

Payne County: Wilcox, Amerada, and Cities Service 1 Lee, NE NE SW 10-18n-2e, 30 bbl. 40°-gravity oil from lower Skinner at 4,302-16 ft., TD 4,950 ft.

Foster Drilling Co. 2 Pence, SW NW NE 21-18n-6e, 44 bbl. 37°-gravity oil from Red Fork at 3,042-52 ft., TD 3,068 ft.

Prior 1 Vincent, NE NW NW 23-20n-4e, 30 bbl. oil from Misener at 3,964-68 ft., TD 3,971 ft.

OKLAHOMA WILDCAT FAILURES

Comanche County: Fields-Roberts 1 Horton, NE SW NW 21-2n-12w, dry, TD 1,510 ft.

Garfield County: Mid-Continent Petroleum Corp. 1 Lowenhaupt unit, C SW SE 14-21n-8w, dry, TD 7,970 ft.

Midstates Oil Co. 1 Hale, NW NW SE 14-23n-3w, dry, TD 3,995 ft.

Clark & Walton 1 Bunken, SE SE NE 35-23n-4w, dry, TD 1,550 ft.

Grant County: Ashland 1 Albright, NW NE SW 31-27n-7w, dry, TD 5,975 ft.

Kay County: Ellison 1 Shawver, NW SE NE 13-25n-1w, dry, TD 4,370 ft.

Helmerich & Payne 1 Brazelton, SE SE NW 5-27n-1e, dry, TD 3,672 ft.

Manahan Oil Co. et al 1 Gingerich, NE NW SW 29-28n-1w, dry, TD 3,066 ft.

Kiowa County: McWhirter 1 State of Oklahoma, NE SE NW 26-7n-16w, dry, TD 500 ft.

Lincoln County: Harper & Turner 1 Cochran, SW SW SW 26-15n-4e, dry, TD 4,267 ft.

Grimmett 1 Anderson, SW SW NW 24-16n-4e, dry, TD 4,583 ft.

Noble County: Suntex Drilling Co. 1 McCoy, SE SE SE 23-20n-2w, dry, TD 4,040 ft.

Okfuskee County: Billingslea 1 Taylor, NW NW SE 3-13n-8e, dry, TD 4,166 ft.

Oklahoma County: Peppers 1 Thoresen, NW NW NE 9-13n-3w, dry, TD 6,545 ft.

Okmulgee County: H. L. Wirick, Jr., 1

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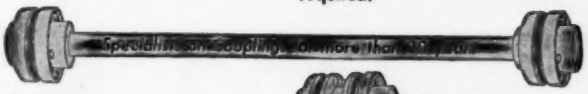

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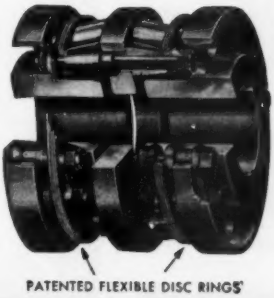

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Chauncey, SW SW NW 32-11n-12e, dry, TD 1,252 ft.
Manhart, Millison & Bebee 1 Lewing, SW NW NW 22-14n-15e, dry, TD 2,568 ft.
Osage County: Johnson Oil & Refining Co. 1 Osage, SE SE SW 18-22n-8e, dry, TD 3,040 ft.
Oliphant 1 Osage, SW NE SE 7-25n-3e, dry, TD 3,030 ft.
Payne County: Jones & Co. 1 Heavener, SE NE SE 17-18n-5e, dry, TD 3,863 ft.
Jones-Shelburne 1 Groom, SE SE SE 10-20n-4e, dry, TD 4,048 ft.
Seminole County: Globe Oil & Refining Co. 1 Simmons, SE NE NW 20-10n-8e, dry, TD 3,643 ft.
Falcon-Seaboard 1 Decker, NW NE SW 32-11n-6e, dry, TD 4,649 ft.

Appalachian-Ohio

Garrett County, Maryland Development Continues

PITTSBURGH.—In Garrett County, Maryland, Columbian Carbon Co. 1-1507 Noah Lichty resulted in a dry hole. On an elevation of 2,419 ft., the chert was encountered at 4,596 ft. and water at 4,623 ft.; total depth is 4,626 ft. Matthews & Gooseman 1 M. L. Calhoun, elevation 2,431 ft., was also dry. This wildcat found the Tully from 3,540-3,560 ft.; total depth is 4,290 ft. Eberly & Snee 1 Simmons, elevation 2,405 ft., reported the chert at 3,740 ft., with gas testing 1,300,000 cu. ft. at 3,753 ft., and is shut down at 3,763 ft. The same operators reached the chert at 3,820 ft. in their 2 Gordon, elevation 2,486 ft., and are drilling at 3,831 ft.

New York State Natural Gas Corp. 2-247 J. K. Shaw, elevation 2,438 ft., topped the Oriskany sand at 3,904 ft., tested 370,000 cu. ft. of gas from 3,958-89 ft., and is shut down at 3,992 ft. Blaho Oil & Gas Co. 1 Dorcie Rumer, elevation 2,490 ft., shows for gas testing 29,000 cu. ft. in the Oriskany at 3,944 ft.; the zone was topped at 3,940 ft.

Southwest Pennsylvania.—In South Buffalo Township, Armstrong County, Pittsburgh Plate Glass Co. 2-839 Mary McGinley, elevation 1,153 ft., is shut down at 6,936 ft. The Onondaga was found at 6,747 ft., and the Oriskany sand from 6,917-27 ft. No gas was encountered in the latter formation. In Napier Township, Bedford County, South Penn et al-Snee & Eberly 1 J. B. Miller, elevation 1,866 ft., is drilling at 8,942 ft. In Unity Township, Westmoreland County, Peoples Natural Gas Co. 1-4003 A. J. Dotterway, elevation 2,094 ft., is drilling at 2,425 ft.

West Virginia.—In Buffalo district, Putnam County, Teavee Oil & Gas, Inc. 1 Parsons heirs tested 1,000,000 cu. ft. of gas in the Brown shale; total depth is 4,620 ft. In Union district, Godfrey L. Cabot, Inc. 45-1340 Putnam Co. had 38,000 cu. ft. of gas in the shale, Corniferous lime at 4,927 ft., Oriskany sand from 5,029-75 ft., and total depth 5,084 ft. The same company's 45-1360 McLean heirs showed 643,000 cu. ft. of gas in the Berea sand; Corniferous lime at 5,013 ft., Oriskany at 5,116-53 ft., total depth 5,161 ft. No Oriskany sand gas was found in these two wells.

Virginia.—Opening of a new natural-gas field in the northwestern part of the state has been reported by the United Fuel Gas Co., drilling at Bergton, Rockingham County, near the West Virginia border. Although isolated and rather far from neighboring producing fields, the company said the gas can be delivered to transmission pipe lines if sufficient quantity is developed. On test, the Bergton well produced an average of 1,043,000 cu. ft. of gas a day. The only commercial gas wells now producing in Virginia are in the extreme southwest portion of the state.

MARYLAND WILDCAT FAILURES
Garrett County: Columbian Carbon Co. 1-1507 Lichty, dry, TD 4,626 ft.
Matthews & Gooseman 1 Calhoun, dry, TD 4,290 ft.

OHIO

An important northeast extension to New Castle pool was drilled in by McCall Drilling Co. on 1 L. W. Ogle, Section 18, New Castle Township, Coshocton County. Clinton sand was found at 3,349-3,407 ft. with 17 ft. of pay in the bottom that made 50 bbl. natural. The well will probably be shot before completing.

In the southeast part of the pool, Preston Oil 5 Edith Daliere, Section 23, made 60 bbl. natural from sand at 3,288-3,324 ft., and 120 bbl. in 24 hours after a 60-qt. shot.

Willard Shrider 3 Paul Funk, third quarter, came in as a small producer. Sand at 3,280-3,318 ft. showed 4 bbl. natural and 20 bbl. after shot.

Roy Stewart 1 R. J. Patterson, Section 15, Prairie Township, Holmes County, an east offset to the gasser on Bessie Clinage, had an oil showing in the upper Clinton at 3,528-66 ft., also in the lower red beds at 3,587-3,608 ft. Both sands were shot and 50 bbl. was swabbed out in the first 24 hours.

Status Development 1 M. W. C. D., Lot 38, Sandy Township, Tuscarawas County, gaged 325,000 cu. ft. of gas natural and 500,000 cu. ft. when shut in after shot. Clinton was found at 4,652-4,734 ft.

OHIO WILDCAT FAILURE
Summit County, Copley Township: Ed Obermiller et al 1 William A. Byrider, Lot 38. Clinton 3,739-74 ft., TD 3,784 ft.

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November 15, 1951

South Louisiana

Terrebonne Parish Wildcat Flows 203 Bbl. Oil on Test

NEW ORLEANS.—Humble Oil & Refining Co. 1 Louisiana Land & Exploration Co. "D," wildcat in the Bayou Jean la Croix sector of Terrebonne Parish, on latest gage flowed 203 bbl. of oil daily through ⅛-in. choke. Flowing pressure on the tubing was 4,600 psi., gravity 37.3°, and gas-oil ratio 5,180:1.

Operator is preparing to squeeze perforated zone at 13,214-17 ft. and perforate in a lower zone in an attempt to reduce the gas-oil ratio. Two previous tests were conducted on the well. On initial test, the well flowed 329 bbl. of 36.7°-gravity oil daily through ⅛-in. choke under tubing pressure of 5,400 psi. On second test, flow was 241 bbl. daily through ⅛-in. choke with flowing tubing pressure of 4,600 psi.

Meanwhile, Humble staked location for a new test in the Lake Merchant area of Terrebonne Parish. Venture is 2 Louisiana Land & Exploration Co. "B," spotted in 11-20s-14e. The company drilled 1 L. L. & E. Co. "B" in 13-20s-14e, dry at total depth of 14,000 ft., in June of this year.

Caroline Hunt Sands has resumed operations at a Cameron Parish wildcat, 1 Sweetlake Land & Oil Co., after having been shut down for rig repairs. At total depth of 9,581 ft., crews attempted to run 9⅝-in. casing when derrick collapsed. Electric survey indicated a possible oil sand from 9,380-98 ft. Operator is now drilling below 9,730 ft. Drill site is on a seismograph high.

The Texas Co. has plugged its confirmation test to its new Blind Bay discovery in Plaquemines Parish. The well, 2 State Lease 1605-Blind Bay, Township 22s-21e, was at total depth of 9,983 ft. It was located 4,500 ft. east of the discovery well, which flowed 97 bbl. of 36°-gravity oil daily from perforations at 8,387-89 ft.

A new test has been staked in the one-well Reeves field, Allen Parish, at Thomas Jordan, Inc., 1 Industrial Lumber Co., which has a proposed depth of 7,600 ft. The venture is located 1,320 ft. southwest of Niloco Co. and Bel Oil Corp. 1 J. A. Bell,

confirmation to the discovery well. Although the confirmation test ran about flat structurally with the discovery, sands encountered shaled out.

SOUTH LOUISIANA WILDCAT FAILURES

Avoyelles Parish: Hunt Oil Co. 2 Chas. B. Peterson, et al, 26-4n-5e, dry, TD 7,941 ft.

Lafourche Parish: Union Oil Co. of California 1 Bowie Lumber Co., 1-14s-17e, dry, TD 12,411 ft.

Plaquemines Parish: Gulf Refining Co. 1 Louisiana State Lease 1873, Township 23s-31e, dry, TD 9,658 ft.

Kansas

Gove County Wildcat Shows for Production

SWABBING tests in Musgrove Petroleum Corp.'s prospective discovery well northwest of Gove, in Gove County, western Kansas, yielded 7 bbl. of oil per hour. The well, 1 Teeter, NE NE SE 26-13-30, is testing showings encountered in the Mississippian section, opposite which casing is perforated at 4,547-50 ft. Top of the section was logged at 4,492 ft. Bottom of the hole is 4,725 ft. with 5-in. casing at 4,683 ft.

If completed as an oil producer, the well will open the county's third pool, all of which have been discovered within the past year and a half. It will be the first Mississippian production. The Coberly pool, first discovery in the county and productive from the Marmaton, is located 7 miles to the southeast. The county's other pool, opened within the past month and productive from the Lansing-Kansas City lime, is located 8 miles southwest of the Coberly pool.

Sam Kelinson and associates are testing their 1 Pfeifer, NW NW NW 6-16-17, an indicated Lansing-Kansas City lime discovery well in northern Rush County, Reagan sand, to which the hole was carried, showed water when plug was drilled out. Hole now has been plugged back and casing perforated in the higher Lansing-Kansas City prospective pay zone. Prior to swabbing, hole filled 1,000 ft. with oil in 45 minutes. Top of the Lansing has been logged at 3,198 ft. (—1,299 ft.). A drill-stem test in that section yielded 1,675 ft. of oil. The Reagan zone was topped at 3,502 ft. (—1,603 ft.) and drilled to 3,512 ft. Bottom of the casing is 3,504 ft., 2 ft. in the formation. Gas and oil showings also were found in Arbuckle lime, topped at 3,447 ft. Nearest production is 4 miles to the northwest in the Schoenchen pool, in Ellis County.

Pickerell Drilling Co. 1 Putnam, SW SW SW 1-17-14, a wildcat 1 mile southwest of production of the Barrett pool in northern Barton County, swabbed at an average rate of 5 bbl. of oil per hour during a 7-hour period while testing through casing perforations at 3,273-84 ft. Pay zone is in the Lansing-Kansas City lime, topped at 3,224 ft. (—1,238 ft.). Previous tests with casing perforated at 3,288-94 ft. in the same zone yielded 1½ bbl. of oil per hour. The two intervals are separated by a plug at 3,285 ft. Bottom of the hole is at 3,530 ft. in Arbuckle, topped at 3,501 ft. Casing is bottomed in the latter formation at 3,505 ft.

Ellis County has an indicated Arbuckle lime discovery, located 1½ mile northeast of the North Pleasant pool., Globe Oil & Refining Co. 1 Garken, SE NE SE 24-13-20, the prospective discovery well, found good saturation in that formation, topped at 3,820 ft. (—1,630 ft.). A 12-minute drill-stem test, with hole drilled to 3,841 ft., filled 180 ft. of oil and 60 ft. of oil-cut mud. Casing has been run to 3,822 ft. for completion.

KANSAS SUCCESSFUL WILDCATS

Gove County: Herndon Drilling Co. et al 1 Jasper, NE NE NE 30-15s-29w, 41 bbl. oil from Lansing at 3,670-73 ft., TD 4,324 ft.

Graham County: Sidney 1 Worchester, NW NW NW 23-7s-22w, 237 bbl. oil from Arbuckle topped at 3,791 ft., TD 3,798 ft.

Kingman County: Iron Drilling Co. 1 Boyle SW NW NW 23-30s-8w, 270 bbl. oil from Mississippian at 4,238-60 ft., TD 4,755 ft.

KANSAS WILDCAT FAILURES

Butler County: Bay Petroleum Co. 1 Hazen, SW SW SE 36-26s-3e, dry, TD 3,114 ft.

Cowley County: Wiedemann 1 Sattler, NE SE SW 14-31s-3e, dry, TD 3,368 ft.

Ellis County: Isern Drilling Co. 1 Slimmer, SE SE NE 2-11s-17w, dry, TD 3,489 ft.

Helmerich & Payne 1 Rande, NW SW SE 21-14s-18w, dry, TD 3,700 ft.

Ford County: Lauck 1 Warner, SE SE SW 5-25s-23w, dry, TD 4,869 ft.

Graham County: Nadel & Gussman 2 Newell, SW SW SE 30-8s-21w, dry, TD 3,798 ft.

Deep Rock Oil Corp. 1 Griffith, SE SE NE 15-8s-22w, dry, TD 3,757 ft.

S. B. Smith, Jr., et al 1 Grecian, SW SW NW 30-10s-21w, dry, TD 3,992 ft.

Marion County: Artnell 1 Hudson, NW NW NE 22-21s-3e, dry, TD 2,880 ft.

McPherson County: Dunne & Strait 1 Seifried, SE SE NW 14-20s-3w, dry, TD 3,060 ft.

Rice County: Westgate-Greenland 1 Byard, SW SW NE 5-19s-7w, dry, TD 3,460 ft.

Elreco et al 1 Miller, NW NW SW 7-21s-10w, dry, TD 3,440 ft.

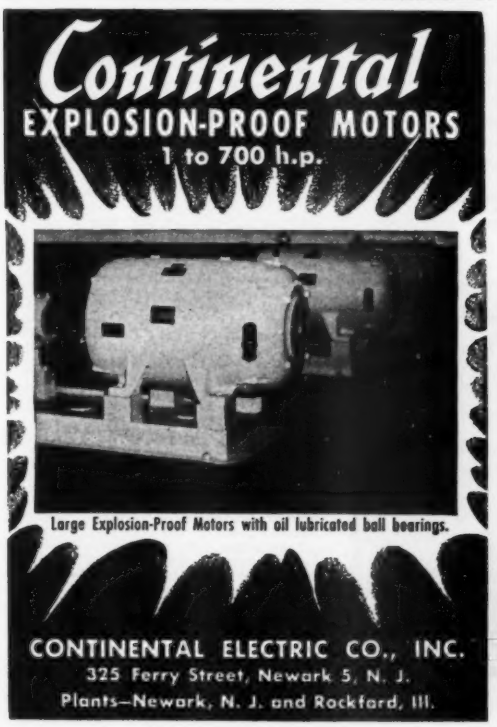
Rush County: The Texas Co. 1 Zimmerman, SE SW SE 25-18s-16w, dry, TD 3,630 ft.

Russell County: Duke & Wood 1 Turner, SW SW SW 34-14s-11w, dry, TD 3,261 ft.

Sedgwick County: Gaty 1 Rick, SW SW NE 16-28s-2e, dry, TD 3,280 ft.

Sheridan County: Gore 1 Glasgow, NE NE NW 21-6s-26w, dry, TD 4,315 ft.

Trego County: Veeder Supply Co. 1 Hall,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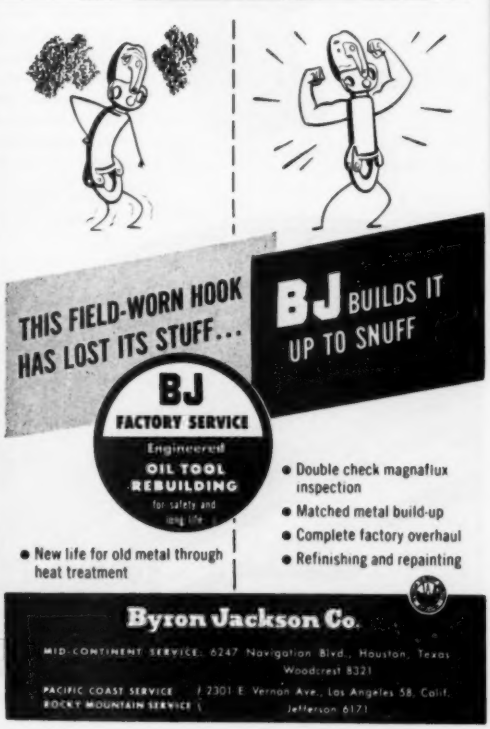
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SE SE SE 14-13s-21w, dry, TD 3,955 ft. Anschultz 1 Bender, NE NE SE 17-13s-23w, dry, TD 4,635 ft.

Eastern Texas

Grayson County Confirmation Try Nearing Expected Pay

DALLAS.—East offset and confirmation well to Sadler-Pennsylvanian field of Grayson County (see map and field-progress article in this issue) was nearing the excepted pay. At last report Mid-Continent Petroleum Corp. 2 Susie Martin, I. B. Walker Survey, was drilling below 6,100 ft. in shale.

D. D. Feldman 2 Mulder, located 2,640 ft. from north and 1,343 ft. from east lines, J. Barefoot Survey, was drilling ahead at 8,306 ft. in lime. The test originally was projected to 8,000 ft. Formation tops had not been announced, but electrical surveys run at 7,405 ft. indicated an oil sand at 7,305-54 ft. The section apparently was not tested, but a drill-stem test from 7,885-98 ft. had gas in 14 minutes and oil in 28 minutes and recovered 6,500 ft. of oil with some gas and salt water. Bottom-hole pressure reached 3,650 psi. in 20 minutes. A test from 8,252-8,306 ft. recovered mud with no shows.

In Rains County, R. J. Caraway 1 Jenkins-Shipp, 6 miles southeast of Emory, was drilling in shale and lime at 7,941 ft. on a 12,500-ft. contract. It had the Paluxy at 6,160 ft.

Coats Drilling Co. 1 H. Brin Estate, northwest of Emory, was drilling at 7,930 ft.

Byars & Kurth 1 Angelina Lumber Co., Angelina wildcat 6 miles southeast of Lufkin, was nearing contract depth of 7,500 ft. It was at 7,410 ft. in chalk and shale, with no shows or tests reported.

Pevota & Hager 1 L. E. Moore, Hunt County wildcat southwest of the Campbell area, was coring the Eagleford at 2,920 ft. According to reports, it was to core through the Woodbine.

EAST TEXAS (DISTRICTS 5 AND 6) WILDCAT FAILURES

Cherokee County: Conley Oil Co. 1 H. C. Grisson, W. T. Smith Sur., dry, TD 5,004 ft.

Grayson County: A. J. Hickey 1 B. S. Hackleman, G. W. Cochran Sur., 4 mi. E Whitesboro, dry, TD 6,875 ft., Simpson 6,226 ft., Oil Creek 6,248 ft., Arbuckle 6,460 ft.

W. A. Winfrey 1 Allen Roach, W. Southward Sur., A-112, dry, TD 3,999 ft.

Kaufman County: T. D. Humphrey 1 Jack Mallory, W. T. Brewer Sur., dry, TD 6,895 ft.

Vernon Whitely 1 A. D. Gardner, P. Walker Sur., dry, TD 4,948 ft.

Wood County: Jackson & Deupree 1 W. C. Bartlett, J. C. Bradford Sur., dry, TD 7,530 ft.

Phillips & Stevens 1 Sally L. Olds, J. B. Chirino Sur., dry, TD 5,070 ft., Woodbine 5,056 ft.

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Texas Gulf Coast

Harris County Discovery Potentials 85 Bbl. Daily

HOUSTON.—Potential test has been run on a new discovery for Harris County at Amerada Petroleum Corp. 1 Linda F. West, located 2 miles west-northwest of Fairbanks. From perforations at 7,495-7,500 ft., the well flowed 85 bbl. of 36.4°-gravity oil daily through a 10/64-in. choke. Tubing pressure registered 340 psi., casing sealed.

Woodley Petroleum Co.-Stanolind Oil & Gas Co. 1 Iris Clark, et al, has opened a new oil producing area in Grimes County 7½ miles northeast of Shiro. The well is credited with 21 bbl. of 35°-gravity oil daily from perforations at 4,688-92 ft. Gage was made through a 12/64-in. choke. Well was drilled to total depth of 8,198 ft. and plugged back to 4,840 ft. Tubing pressure on the test was 1,550 psi.

Standard Oil Co. of Texas has opened gas-condensate production in Chambers County 1½ miles east of Jackson Pasture field. The wildcat, 1 W. F. Gau, flowed 4 bbl. of 58.9°-gravity condensate hourly on 3-hour drill-stem test of perforations at 8,289-90 ft. Flow was gaged through a 6/64-in. choke. Tubing pressure on the test was 2,510 psi. Operator is still testing.

In Austin County, 7½ miles northwest of Bellville, Anderson-Prichard Corp. is still testing 1 Miles Knolle with no success. Latest test on the wildcat was at 10,240-42 ft. with recovery being muddy water. At interval 10,242-44 ft., recovery was 75 ft. of mud. Both tests were open for 2 hours.

Sunray Oil Corp. has run 5½-in. production casing in 16 J. Pickering, wildcat ¾ mile southeast of Ben Shelton field in Victoria County. Samples showed sand with oil odor, fluorescence, and porosity in several sections.

A new gas pay has been opened in an unnamed field in Brazoria County at Brazos Oil & Gas Co. 2 J. L. Ducroz, C. Summells Survey, Abstract 363. Completion was made through perforations at 3,932-36 ft. and 3,938-46 ft., however, no gage has been made on the gas flow. The well is located 2,092 ft. southwest of 1 Ducroz, discovery well.

Four miles west of Refugio in Refugio County, Sam E. Wilson C-1 Jamie Hynes, oil discovery, has been gaged for 65 bbl. of oil daily from perforations at 4,651-56 ft. Production was gaged through 11/64-in. choke, under tubing pressure of 240 psi. The discovery is located in Manuel Arocha Survey, Abstract 79.

TEXAS GULF COAST (DISTRICTS 2 AND 3) SUCCESSFUL WILDCATS

Brazoria County: New pay in unnamed field—Brazos Oil & Gas Co. 2 J. L. Du-

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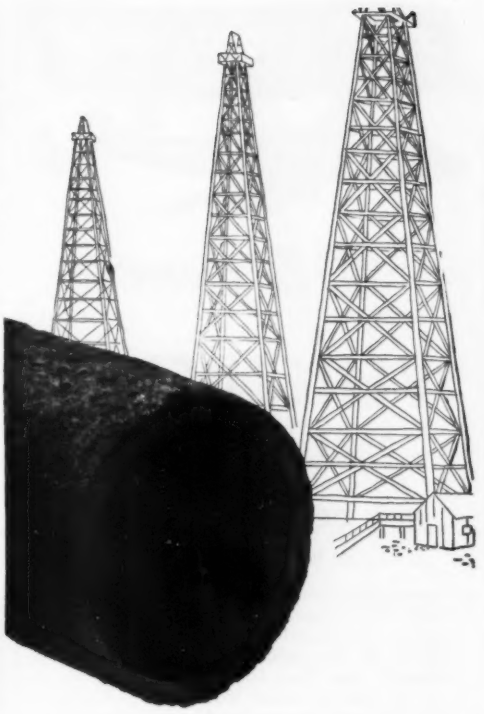

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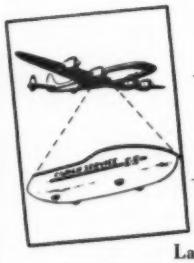

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croz, Calvin Summells Sur., A-368, TD 4,508 ft., perf. 3,832-36 and 3,938-46 ft., IP: gas well, no gage.

Calhoun County: Gas-condensate discovery—C. G. Glasscock 1 F. A. Street, Casillas S. Paschall and J. J. Ogsberry Sur., TD 5,895 ft., perf. 5,773-80 ft., IP: 128 bbl. condensate per day, ¼-in. choke.

DeWitt County: Gas discovery — Magnolia Petroleum Co. 1 Anna Sinast, Henry Clark League, A-112, TD 7,463 ft., Slick 7,343-59 ft., IP: 5,000,000 cu. ft. of gas per day, open flow, SIP 2,503 psi.

Goliad County: Gas discovery—Dallas Husky 2 J. Fell, Sampson McTornall Sur., A-195, TD 2,950 ft., perf. 2,030-40 ft., IP: gas well, no gage.

Live Oak County: Oil discovery "Sheriff Smith"—Sunray Oil Corp. 1 W. A. Smith, T. B. Reese Sur., TD 7,548 ft., perf. 7,030-40 ft. (Wilcox), IP: 53 bbl. oil per day, ¼-in. choke, 33.2° gravity.

Victoria County: Gas discovery—G. W. McCarter 1 Alex Angerstein, Zepeda Grant, A-128, TD 4,300 ft., perf. 2,200 ft., IP: 20,000,000 cu. ft. of gas per day.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Calhoun County: Humble Oil & Refining Co. 1 Espiritu Santo Bay, State Tract 202, Espiritu Santo Bay Sur., dry, TD 6,505 ft.

Fayette County: Hamman Oil & Refining Co. 1 Joseph Tupa, et al, J. E. Tatum Sur., dry, TD 2,500 ft.

Jackson County: Cecil Hagen 1 Knipling Estate, P. Scott Sur., A-69, dry, TD 7,300 ft.

Karnes County: L. R. Allison 1 Albert Bergmann, S. A. G. Mays Sur., A-212, dry, TD 3,630 ft.

Liberty County: General Crude Oil Co. 1 C-1 Moores Bluff "C," Block 22 of Angus McNeil Sur., dry, TD 9,278 ft.

Matagorda County: Skelly Oil Co. 1 H. B. Hawkins, T. N. Duke Sur. 31, A-30, dry, TD 13,285 ft.

Tyler County: Neil W. Stewart 1 Mary Lee Fosford, BBB&C RR Sec. 15, A-148, dry, TD 8,451 ft.

Victoria County: M. T. Grubb 1 W. F. Mareth, et al, Valentin Garcia Sur., dry, TD 6,650 ft.

Tri-Mark Oil Co. 1 County of Victoria, Manuel Zepedo Sur., A-128, dry, TD 4,535 ft.

Rocky Mountain

Montana Wildcat Indicates New Williston Discovery

DENVER.—A possible new discovery for the Williston basin is indicated following tests at The Texas Co.'s Cedar Creek wildcat in Dawson County, Montana. The well is 1 Northern Pacific "B," C NE NE 35-15n-54e, and oil was recovered on two tests, probably in Ordovician. On the first test, 8,830-8,930 ft., the well had gas at the surface in 75 minutes with a recovery of 420 ft. of 39°-gravity oil and 120 ft. of oil-cut mud. The second test, 8,929-79 ft., tool open 2 hours, showed 455 ft. of 35°-gravity oil and 295 ft. of gas-cut mud. Pressures were low, with the highest on the second test at 600 psi. This wildcat is located between Shell Oil Co.'s Richey wildcat, which found oil in the Mississippian, and Shell's Pine Unit, where shows were logged in the Ordovician. Shell is now near completion tests on these two wildcats. Texas is coring ahead at the Cedar Creek wildcat and will continue tests. To the present depth the cores have shown very hard, tight dolomite in the zones tested.

A new discovery for the Powder River basin is rated of importance. Stanolind Oil & Gas Co.-Continental Oil Co. tested oil in the Tensleep at 1 Government-Mains, C SW SW 19-44n-81w, in the North Fork area, Johnson County, Wyoming. The well made 741 ft. of oil and 65 ft. of oil-cut mud on test of the zone 6,484-97 ft. with Tensleep topped at 6,485 ft. A second test showed 1,036 ft. of oil and 80 ft. of oil-cut mud in 1 hour from 8,484-8,507 ft. On a third test, 6,507-18 ft., the well made 600 ft. of oil in 1 hour, and another at 6,518-45 ft. showed only a small amount of mud. The operator is now running casing with total depth at 6,545 ft. This wildcat is 20 miles northwest of the Sussex field, where Tensleep oil was discovered earlier this year. The North Fork wildcat did not have shows in the Lakota or other Cretaceous sands which are productive at Sussex.

Byrd-Frost, Inc., is now completing the new gas discovery in the Clear Creek area, Carbon County, Utah, with the well rated good for 10,000,000 cu. ft. of gas daily. The well is 1 Utah Fuel Co., NW SW SE 5-14s-7e (Salt Lake Meridian), and production is from Ferron sand. The well is producing from the zone 4,690-4,711 ft. Byrd-Frost plan to start an immediate development program in this field to determine reserves prior to completion of market plans for the gas.

Shell has announced the second of a series of wildcats in north-central South Dakota. The new well will be 1 J. K. Winter, NW SW 11-22n-19e, Corson County, some 60 miles northeast of a recent wildcat failure. Shell's 1 Homme, C NW SE 13-20n-12e, Perkins County, went to 9,348 ft., total depth, in granite. Some gas shows were reported, but there were no commercial recoveries on test. This series of wildcats follows extensive seismic work through this area by Shell and is of importance as the first wells drilled through this particular portion of the Williston basin.

Ohio Oil Co.'s D sand discovery in the East Brownson area at 1 Runge, SE NE SE 17-14n-50w, Cheyenne County, Nebraska, was the only discovery completed during the week. The well made 125 bbl. of oil daily on pump for the initial. However, two extension attempts in the field have failed, indicating a small producing area for this new pool.

Included in the new wildcats for the region is location for the Spring Branch well, a deep test at 1 Unit, NW SE NW 26-13n-111w, Sweetwater County, Wyoming. The California Co. is operator, and the well is located southeast of Church Buttes field, where gas was discovered in the Dakota at around 12,000 ft. 3 years ago. California has done seismic work through this area.

WYOMING WILDCAT FAILURES

Big Horn County, Paintrock area: Shell Oil Co. 1 Gov't., C NE NE 2-49n-91w, TD 2,506 ft., dry, Gypsum Springs 568 ft., Chugwater 620 ft., Dinwoody 1,630 ft., Phosphoria 1,723 ft., Tensleep 2,037 ft., Amsden 2,195 ft., Madison 2,345 ft.

Niobrara County, East Bridge Creek area: Bruce Anderson 1 Rennard, NW SE SW 21-39n-61w, TD 2,763 ft., dry, Niobrara 440 ft., Carlile 1,240 ft., Greenhorn 1,470 ft., Belle Fourche 1,560 ft., Mowry 2,000 ft., Dakota 2,440 ft., Fuson 2,560 ft., Lakota 2,640 ft., Morrison 2,740 ft.

Park County, Northwest Hart Mountain area: Husky Oil Co. 1 Two Dot, C SE NW 26-55n-103w, TD 6,293 ft., dry, Frontier 1,050 ft., Mowry 1,455 ft., Dakota 2,530 ft.

Sheridan County, Ash Creek area: Shell Oil Co. 1 Gov't., C SW NE 23-58n-85w, TD 10,848 ft., dry, Eagle 4,344 ft., Telegraph Creek 4,550 ft., Sundance 7,890 ft., Red Beds 7,900 ft., Tensleep 9,140 ft., Amsden 9,259 ft., Madison 9,493 ft., Big Horn 10,580 ft.

COLORADO WILDCAT FAILURES

Logan County, wildcat: Ryan Oil Co. 2 Woodland, SE SE NW 2-7n-48w, TD 4,391 ft., dry, Carlile 3,510 ft., Greenhorn 3,710 ft., D sand 3,960 ft., J sand 4,002 ft., M sand 4,207 ft., Morrison 4,378 ft.

Montrose County, Horse Fly area: Park Holbert 2 Unit, C NE NW 14-46n-13w, TD 1,616 ft., dry, Mississippian 1,555 ft.

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MONTANA WILDCAT FAILURES

Musselshell County, Southwest Howard Coulee area: The Texas Co. 1 Nebraska Feeding Co., TD 4,070 ft., dry, Ellis 3,065 ft., Reardon 3,204 ft., Gypsum Springs 3,357 ft., Amsden 3,418 ft., Heath 3,747 ft., Otter 4,005 ft.

NEBRASKA WILDCAT SUCCESS

Cheyenne County, East Brownson area: Ohio Oil Co. 1 Runge, SE NE SE 17-14n-50w, TD 4,990 ft., PB 4,880 ft., pumped 125 bbl. oil daily, perf. 4,754-69 ft., first Dakota 4,754 ft., third Dakota 4,906 ft.

NEBRASKA WILDCAT FAILURE

Cheyenne County, East Sidney area: Jack Wise 1 Krueger, NW NW SW 32-14n-48w, TD 4,936 ft., dry, Niobrara 3,579 ft., Ft. Hays 3,847 ft., Greenhorn 4,124 ft., D sand 4,363 ft., G sand 4,420 ft., J sand 4,486 ft., M sand 4,705 ft., O sand 4,750 ft., R sand 4,936 ft.

Permian Basin

Reagan County Given Lower Spraberry Strike

MIDLAND. — Week's developments highlighted further expansion in the Spraberry areas and completion of a discovery in the lower Spraberry sand.

Paul F. Barnhart 1-13 Patterson, lower Spraberry strike in northwest Reagan County, finished for 335 bbl. of 39°-gravity oil a day flowing through 18/64-in. choke. The lower sand was entered at 7,212 ft., minus 4,534 ft., and completion was from open hole at 7,524-77 ft. Location is about 3 miles east of the recent Aldwell Spraberry discovery and 6 miles south of Sohio Oil Co. 1 Proctor, lower Spraberry discovery.

Lion Oil Co. 1 Mrs. Ruby J. Wright, 21-C-I&SV, completed as a 1¼-mile south extension to the Aldwell field. The well had previously flowed 138 bbl. of oil in 24 hours, but completion was on the pump for 125 bbl. a day. Gravity at 43° was high for Spraberry production. Pay section in the upper zone was open hole at 6,746-6,879 ft., total depth.

Along the south line of Glasscock County, where production has been spreading east of the Four-Corner area, Paul Barnhart 1-25 Couey in 25-36-T5S-T&P confirmed Spraberry production to Placid Oil Co. 1 Howard. The latter well was a recent 4-mile extension to Driver field. On completion test, Barnhart 1-25 Couey flowed 280.38 bbl. of oil in 21½ hours and was given a daily potential of 290 bbl. of oil. Pay was the upper Spraberry between 6,524-6,632 ft.

Another old producing area has been brought to attention with deeper-pay possibilities. Gulf Oil Corp. 7-E. W. A. Estes in Section 3, Block 28 in West Sand Hills field produced oil from the Holt limestone around 3,900 ft. before it was reentered on an 8,000-ft. Ellenburger contract.

Top of the Ellenburger had not been reported, but first test in that formation at 7,908-84 ft. developed flowing oil in 12 minutes. It was cleaned into pits for 13 minutes then turned into tanks where it gaged 80 bbl. of 42.6°-gravity oil in 1 hour. Operators were to drill ahead 25 ft. and test again.

Brinkerhoff Drilling Co. 1 Clayton & Johnson, 37-32-T4S-T&P, 8 miles southwest of Gail in Borden County, topped a Pennsylvanian limestone at 8,044 ft., minus 5,601 ft., then drill-stem tested between 8,043-65 ft. Recovery was 270 ft. of mud and oil, estimated to be 50 per cent oil. It was drilled to 8,073 ft. for another test.

Northwest of Salt Creek field in Kent County, Texas Gulf Producing Co. 1 Frank Stewart had a drilling break at 6,230 ft. which was expected to be in the top of the Canyon reef. Operators were going in the hole with coring tools.

In Coke County, Humble Oil & Refining Co. reported free oil on a drill-stem test of the Goen limestone at its 1 Bronte Gas Unit, 453-1A-H&TC. A 3-hour test from 4,835-55 ft. developed 4,500 ft. of 40°-gravity oil. A test from 4,857-67 ft. brought oil to the surface in 11 minutes and flowed at the rate of 51 bbl. of 50°-gravity oil an hour. Flowing pressure was 2,050 psi. through ⅜-in. choke.

Sharples Oil Corp. has completed its 1-C TXL, 47-41-T4S-T&P, as a southwest extension to Pegasus field of Upton County. Potential was 207 bbl. of high-gravity oil a day from perforations in the Ellenburger at 13,114-24 ft.

Union Oil Co. of California 2 Cotton, South Brownfield Canyon field well which had water in the regular pay section and was drilled ahead as an Ellenburger exploration, topped Ellenburger at 12,430 ft., on elevation of 3,261 ft. First test from 12,499-12,523 ft. recovered the water blanket and 15 ft. of drilling mud with no shows.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Mitchell County: Richardson & Bass 1 J. F. McCabe, 5-12-H&TC, TD 7,330 ft., elev. 2,245 ft., Canyon sand 6,045 ft., flowed 78 bbl. 42°-gravity oil, GOR 1,096 cu. ft., TP 300 psi.

Reagan County: Sohio Petroleum Co. 1 O. F. Boyd, 16-E-HE&WT, TD 7,301 ft., elev. 2,667 ft., Spraberry 6,283 ft., perf. 7,145-7,216 ft., flowed 281 bbl. 37°-gravity oil, 48/64-in. choke, GOR 750 cu. ft., TP 220 psi.

Sohio 1 Leonard Proctor, 32-36-T5S-T&P, TD 7,656 ft., elev. 2,714 ft., pay 7,565 ft., flowed 645 bbl. 40°-gravity oil, 25/64-in. choke, GOR 512 cu. ft., TP 225 psi.

Runnels County: Aztec Oil Co. 1 Nettie Currie, Sec. 163, ETRR Sur., TD 4,630 ft., elev. 1,698 ft., Palo Pinto 3,425-36 ft. and 3,444-56 ft., flowed 179 bbl. oil, 16/64-in. choke, TP 100 psi.

B. C. Morrison 1 J. T. Brandon, Sec. 18, M. J. Parramore Sur., TD 3,865 ft., elev. 1,950 ft., Gardner sand 3,830 ft., flowed 1,200 bbl. 44°-gravity oil, ⅞-in. choke, GOR 650 cu. ft., TP 400 psi.

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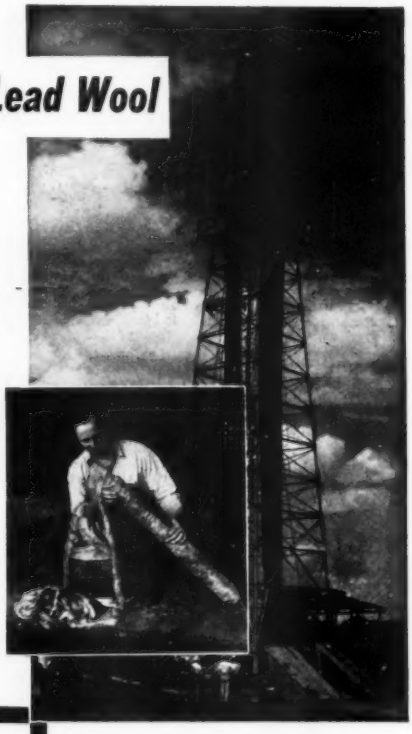

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Sutton County: Shell Oil Co. 2 W. A. Miers, 55-14-TW&NG, TD 5,216 ft., pay 4,265 ft., 6,800,000 cu. ft. gas, open 2-in. tubing.

Upton County: American Republics Corp. 1 J. E. Hill, 20-D-EL&RR, TD 7,140 ft., elev. 2,724 ft., pay 7,050 ft., flowed 252 bbl. 39°-gravity oil, 19/64-in. choke, GOR 647 cu. ft., TP 175 psi.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Cochran County: Ish McKnight and Parker Drilling Co. 1 J. G. Nichols, 8-Y-PSL, TD 4,851 ft., elev. 3,958 ft., San Andres 4,030 ft.

Crockett County: Terrell Petroleum Co. 1 Texas University Lands, 17-42-University, TD 1,541 ft.

Howard County: Spartan Drilling Co. 1 Phillips, 19-33-T2N-T&P, dry, TD 5,694 ft., elev. 2,590 ft., Clear Fork 4,625 ft.

Hudspeth County: J. P. Hurndall and R. A. Gray 1 J. S. Pierce, 8-46-PSL, dry, TD 1,179 ft.

Lubbock County: Seaboard Oil Co. 1 Edna Davis, 36-20-HE&WT, dry, TD 10,852 ft., elev. 3,239 ft., Dean 7,900 ft., Pennsylvanian 10,122 ft., Mississippian 10,285 ft.

Lynn County: Humble Oil & Refining Co. 1 J. Q. Cox, 49-E-EL&RR, dry, TD 11,533 ft., elev. 3,281 ft., Strawn 10,014 ft., Mississippian 10,710 ft., Ellenburger 11,400 ft.

Pecos County: Superior Oil Co. 1-4 J. L. Nutt, 4-144-T&STL, dry, TD 9,111 ft., elev. 2,821 ft., Joins 8,690 ft., Ellenburger 8,698 ft.

Thomas & Simon 1 B. L. Smith, 7-10-H&GN, dry, TD 1,667 ft.

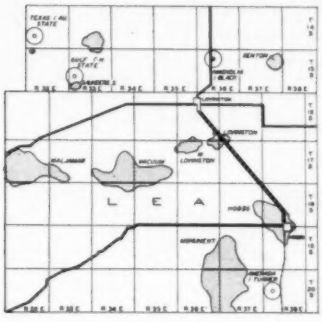
Terry County: Texas Gulf Producing Co. 1 Dan Auld, 92-4X-D&SE, dry, TD 10,006 ft., elev. 3,264 ft., Spraberry 7,065 ft., Dean 8,580 ft.

Tom Green County: M. J. & M&M Consolidated Oil Co. 1 M. D. Bryant, 26-3-H&TC, dry, TD 7,203 ft., elev. 2,159 ft., Clear Fork 1,110 ft., Strawn 6,788 ft.

SOUTHEASTERN NEW MEXICO

New discoveries and many important extensions to proven areas have given operators in this area a good year. Number of active rigs, currently running over 170, is relatively high.

Amerada Petroleum Corp. 1 Fred Turner, east of the Monument area and 1½ miles northeast of Clear Fork production,



was drilling ahead at 7,590 ft. on a 9,500-ft. contract. The well flowed 20 bbl. of oil an hour on drill-stem test of an unidentified section at 7,245-7,410 ft.

Forest Oil Corp. and Houston 1 Lowe, between Gladiola and Denton fields, was making new perforations in an effort to shut off water. The interval from 10,152-62 ft. developed a flow of 689 bbl. of fluid in 10 hours through ¼-in. choke, which was 80-90 per cent water. Drill-stem test of the same interval, before acidizing, recovered 6,000 ft. of oil and gas-cut mud. Total depth was 13,145 ft. in Devonian dolomite, plugged back to 10,408 ft.

The Texas Co. 1-AU State, 2 miles north of a Pennsylvanian discovery, developed 1,910 ft. of free, 43°-gravity oil on a drill-stem test of the Wolfcamp at 9,710-79 ft. It was drilling ahead.

Fullerton Oil Co. 1 Elliott-Federal, east of Ellenburger production, topped the McKee sand at 7,942 ft. then flowed around 10 bbl. of oil an hour on drill-stem test from 7,965-92 ft. and 17 bbl. hourly at 7,994-8,030 ft.

Northeast of Lovington, Magnolia Petroleum Co. was assured of Pennsylvanian production. A 24-hour test on perforations at 11,466-84 ft. flowed 70 bbl. of 45°-gravity oil and 64 bbl. of acid water.

Wilshire Oil Co. 1 Townsend, northwest of Lovington field, was drilling below 10,575 ft. on a 12,500-ft. contract. Drill-stem test in either the Wolfcamp or Permo-Pennsylvanian at 10,415-80 ft. flowed an estimated 30-40 bbl. of oil an hour.

Gulf Oil Corp. 1-H State recovered 270 ft. of mud and oil on a drill-stem test of the Pennsylvanian from 10,599-10,646 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Chaves County: Sun Oil Co. 1 Pinon unit, 19-19s-17e, dry, TD 1,911 ft., elev. 6,543 ft., Tubbs 1,200 ft., Abo 1,666 ft., granite wash 1,725 ft.

Lea County: Shell Oil Co. 1-E State, 7-21s-34e, dry, TD 670 ft.

Vickers Petroleum Co., Inc. 1-C State, 7-21s-34e, dry, TD 3,837 ft., elev. 3,749 ft., Yates 3,505 ft., Seven Rivers 3,705 ft.

Western Natural Gas Co. 1 State, 17-24s-38e, dry, TD 9,210 ft., elev. 3,215 ft., Queen 3,810 ft., Tubbs 6,550 ft., Pennsylvanian 7,930 ft., Devonian 8,899 ft., Woodford 9,425 ft.

Roosevelt County: Paul L. Davis 1 Ralph Nix-State, 32-7s-38e, dry, TD 4,841 ft., San Andres 4,020 ft.

TEXAS PANHANDLE (DISTRICT 10)

Testing operations are to commence this week on Bridwell Oil Co. 1 Houghton, Hartley County wildcat which has logged promising oil and gas shows in shallow formations of the Dalhart basin. After reaching a total depth of 4,464 ft. in granite, the well was plugged back to 3,951 ft., where 5½-in. casing was set. Preparations are being made to perforate and acidize prospective pay formations.

Located on the northern flank of Bravo dome, which marks the southwestern boundary of the Dalhart basin, 1 Houghton is the first wildcat to obtain good evidence of production in the western Panhandle region. Cores taken at intervals from 3,850 to 3,965 ft. have recovered limestone and shale having odor, stain, and fluorescence. Drill-stem tests run down to 3,990 ft. have had good recovery of oil and gas-cut mud. Nearest production is 23 miles east in Moore County gas field.

To the south in Oldham County, Superior Oil Co. has abandoned its fourth Matador Ranch test at a depth of 7,074 ft. in granite. The well was drilled tight with no drilling information released. The same company's 6 Matador has been located in League 240, State Capitol Land Survey.

In an attempt to make the well flow, additional perforations were made on The Texas Co. 1 Flowers, but the zones 8,829-35 ft. and 8,840-42 ft. were barren. The well, a 3-mile stepout from Lips field production in Ochiltree County produced a high of 184 bbl. of oil on a 24-hour swab test. Rig has been released, and operator is waiting on a pump unit.

Ten miles northeast of Phillips 1 Hobart Ranch in Gray County, Gulf has made location for 1 John Haggard, a 12,500-ft. Anadarko basin test in Section 5, Block 2, I&GN Survey, Roberts County. Drilling is below 9,200 ft. on the 1 Hobart Ranch, which has had numerous oil and gas shows during drilling and testing operations.

Three more wildcat failures have been recorded for the southern Panhandle area. In Childress County, the Sinclair 1 Mullins was dry at a total depth of 7,953 ft. in Ellenburger. The Hassie Hunt Trust 1 J. A. Cattle Co. in Armstrong County was dry at 7,012 ft. in granite. Final total depth of the Placid 1 Kelly, Donley County wildcat, was 7,040 ft. in granite.

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Louisiana-Arkansas

Miller County Wildcat Has Tuscaloosa Pay

SHREVEPORT.—In Miller County, Arkansas, Skelly Oil Co. 1 Philyaw, NW NW SW 20-16s-26w, is pumping 23 bbl. of oil per day from the Tuscaloosa at 3,554-60 ft. to open new production in the Fouke area. Total depth is 5,840 ft. with 7-in. pipe set to 3,791 ft.

Some 360 ft. of low gravity oil was recovered on a drill-stem test at Marine Oil Co. 1 Pine, North New London area wildcat, Union County. The 15-minute test was run in the Smackover at 6,047-54 ft. Using ¼-in. chokes and no water cushion, the operator had top working pressure of 11 psi. and bottom-hole flowing pressure of 1,200 psi. rising to 2,550 psi. after shut in for 10 minutes. The venture is located in NE NE 30-17s-12w, 1½ miles northwest of New London field which produces from the Cotton Valley.

North Louisiana.—Hunt Oil Co. brought in two discoveries this week. Its 1 Yakey, SE NW 29-4n-8e, pumped 100 bbl. of oil from the Wilcox sand at 6,944-48 ft. Total depth is 7,500 ft. with pipe set at 7,041 ft. The 4 Yakey, a confirmation try, has been staked in SE NE 30-4n-8e.

The 2 Yakey, 3¼ miles southwest of the first well, pumped 82 bbl. of oil from the Wilcox at 6,552-56 ft. Total depth is 7,500 ft. with pipe cemented at 6,662 ft. A confirmation attempt, the 3 Yakey, SE SE 25-4n-7e, failed at 7,515 ft.

NORTH LOUISIANA WILDCAT FAILURES

Concordia Parish: Hunt Oil Co. and Gulf Refining Co. 2 Angelina Hardware & Lumber Co. "C," 660 ft. S and 2,005 ft. W NEc 19-5n-8e, dry, TD 7,505 ft.

Richardson & Bass 1 Madison Oil & Development Co. "E," C SE NW 14-6n-8e, dry, TD 8,023 ft.

Barnett Serio 1 Ford, 1,990 ft. E and 660 ft. N SWc 25-6n-7e, dry, TD 6,820 ft.

Grant Parish: Kenilworth Oil Corp. 1 Dyson, NE NE NW 29-8n-5w, dry, TD 4,518 ft.

Sabine Parish: Davenport 1 Cook, SE NE NE 11-9n-12w, dry, TD 3,601 ft.

West Carroll Parish: Taubert Drilling Co. 1 Gowan, 1,650 ft. S and 1,980 ft. W NEc 8-19n-10e, dry, TD 3,028 ft.

Canadian Fields

Strikes in Two Provinces Pace Current Operations

CALGARY.—Highlighting recent oil developments in western Canada were a "wet gas" discovery in the Buffalo Lake-Bashaw area and a 1½-mile extension in the Camrose Viking sand oil area of central Alberta. Also the group that discovered oil in the Fort St. John area of northeastern British Columbia set string of production casing and planned to commence production tests at that encouraging well immediately.

The Seaboard - Honolulu - Sunray group, Imperial Oil, Ltd., and Anglo-Canadian Oil Co., Ltd., team, each with one-third interest in approximately 1,440 acres in the Buffalo Lake area, discovered "wet gas" in the Lower Cretaceous at a Buffalo Lake exploratory well. This well also found oil shows in the Devonian D1 zone while coring, but drill-stem tests in that section failed to yield any oil recovery, or signs of water. A more recent test, also in the upper section of the Devonian, failed to yield oil, gas, or water. The well, Seaboard-Imperial-Anglo-Buffalo Lake 1, in LSD 9, 11-42-21w4, is now at 4,970 ft., and will be carried down as a test of the lower Devonian horizons. The Lower Cretaceous strike and absence of water in the upper Devonian formations raises hopes for prospects in the lower objectives.

Four 1-hour drill-stem tests in the Cretaceous each yielded gas flows at close to 2,000,000 cu. ft. daily, with rates continuing to build up near the end of the test periods. Accompanying the gas is naphtha or light oil, a small but unspecified volume of which was recovered in the drill pipe after the tests. The Cretaceous "wet gas" came from the interval at 4,335-70 ft. This central Alberta discovery is located about 10 miles east-northeast of Bashaw D3 Devonian oil pool and around 115 miles northeast of Calgary, Canadian headquarters for the three participants of the discovery team.

About 145 miles northeast of Calgary, in the Camrose area, four Canadian independents made a Viking sand oil strike. This venture, Davulco 1, in LSD 12, 21-47-20w4, is 1½ miles southeast of previous Viking oil wells drilled in the area. Although the well did not flow oil, it did show substantial oil recoveries during drill-stem tests, and indicated the presence of about 7 ft. of water-free oil zone. It is believed that the water line was reached at 3,224 ft. Production string of casing has been set and the crew plans to perforate opposite the oil sand and run production tests.

Backing the venture, and participating in 520 acres of rights in the area, are Davies Petroleums, Ltd., Vulcan Oils, Ltd., Hanna Petroleums, Ltd., and Siscoe Gold Mines, Ltd. Davies and Vulcan each have one-third interest in the project, while Hanna and Siscoe have one-sixth interest each.

Northeastern British Columbia's encouraging oil strike at Fort St. John will commence production test operations shortly, in an effort to determine the commercial possibilities of this light oil find. Casing was set during the week, and it is anticipated

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that a lengthy production-test period will commence early during the coming week. The well found crude oil with gravity around 38° some 2 weeks ago, was carried down about 12 ft. from bottom of the discovery drill-stem test interval (to 5,667 ft.), and casing was set. The well, Peace River-Allied Fort St. John 1, is located in LSD 1, 9-83-18w6.

(Continued on page 141)

Central Area

ILLINOIS

Casing has been run to test a prospective discovery well located 5 miles southwest of Flora in the NE NE SW 21-2n-6e, northwestern Wayne County. The well, George & Wrather Drilling Co. and Sam Lewis 1 McGrew, found promising oil showings in both the Rosiclare and McClosky zones. The area is 3 miles from nearest production, being north of the North Johnsonville pool and northeast of the Zenith pool.

Rosiclare saturation was logged at 3,083-89 ft. and McClosky at 3,136-40 ft. A drill-stem test of the former, taking in an interval at 3,077-87 ft. got gas in 5 minutes and a good flow of clean oil in 40 minutes. Opening time was 45 minutes, and in the breakdown, 1,870 ft. of oil was recovered. A 60-minute drill-stem test in the McClosky, taking in an interval at 3,130-45 ft., flowed gas in 40 minutes and filled 115 ft. of clean oil and 70 ft. of heavily oil-cut mud. Neither test showed water. Total depth is 3,204 ft.

Discovery of another new pool is indicated in southeastern Jasper County where Bell Brothers 1 Rudd, NE NW NE 2-5n-10e, had 280 ft. of clean oil and 30 ft. of oil and gas-cut mud in the pipe following a 60-minute drill-stem test of McClosky at 2,845-69 ft. Previous drill-stem tests in the Aux Vases zone at 2,738-56 ft. and the Rosiclare at 2,824-46 ft. also got showings. Casing has been run to bottom of the hole at 2,869 ft. Location is 3½ miles from nearest production in the area 12 miles north of Olney, Richland County.

W. C. McBride, Inc., 1 Lightner, NW SE NE 5-8s-10e, 3½ miles south of New Haven, northeastern Gallatin County, is another wildcat with indications of opening new production. Promising oil showings were found both in the Aux Vases at 2,766-78 ft. and McClosky at 2,882-88 ft. A 60-minute drill-stem test of the former got a good showing of gas and recovered 150 ft. of oil and 30 ft. of oil-cut mud. No test was made of McClosky. Casing has been run to 2,842 ft. in hole drilled at 2,952 ft. The well is a mile from nearest production.

INDIANA

Superior Oil Co. has a prospective new Devonian discovery at its 1 Thomson-Osborne Community, NE NE NW 29-9n-10w, northwestern Sullivan County. Top of the Devonian was logged at 2,479 ft. with saturation at 2,492-96 ft. and 2,556-59 ft. Thirty feet of heavily oil-cut mud was recovered in a 60-minute drill-stem test at 2,465-2,515 ft. No water was indicated. Casing has been run through the section to bottom of the hole at 2,630 ft. The area is 9 miles northwest of Sullivan and 2 miles northwest of the Dodds Bridge pool, nearest production.

WESTERN KENTUCKY

Sun Oil Co. 1 Hinton, 8-N-25, is being tested on the pump to open a new producing area in northwestern McLean County. Pay zone is Waltersburg sand at 1,574-90 ft. Initially, the well pumped at the rate of 100 bbl. of oil per day. Since then, the pay has received a 20-qt. shot of nitro, and at latest report was cleaning. Location is a mile from production in the Comer pool. It is 5 miles northeast of Sebree, Webster County.

Two and a half miles northwest of Sebree, and ¾ mile north of the Webster county line in southern Henderson County, Tuley & Carter Drilling Co. and associates have an indicated Hardinsburg sand discovery at their 1 Royster, SE SE NE 5-N-24. Pay was logged at 1,991-2,005 ft. and casing has been run 1 ft. in the top for completion. A 60-minute drill-stem test got 1,140 ft. of gas, 420 ft. of clean oil and 90 ft. of oil-cut mud. No water was indicated. Location is a mile east of production in the Poole field.

EASTERN KENTUCKY

In Johns Creek pool of northeastern Floyd County, A. V. Hoenig and Ashland Oil & Refining Co. topped the Big lime at 1,527 ft. in 3 James Nunnery and are currently drilling below 1,600 ft. This well is an attempt to extend production to the west.

In Big Sandy gas field (Pike County sector), Columbian Fuel Corp. completed 15 Chesapeake Mineral Co. for 561,000 cu. ft. of gas daily from the Berea sand from 3,555-3,761 ft., total depth. The well was shot with 1,600 lb. of gelatin.

MICHIGAN

A Dundee oil pay was being prepared for testing this week at Lakeland Oil Corp. & C. W. Collin 1 Haynes Estate, NW NW SE 8-15n-1w, Jerome Township wildcat, Midland County. This wildcat, located about 1 mile southeast of the older developed Jerome Dundee oil pool in the same township, is now cased and cemented with 5-in. casing at 3,700 ft. Dundee top was logged at 3,667 ft., and a porous limestone oil pay was drilled at 3,735-37 ft., present total depth. Hole carried 500 ft. of free oil natural in 8 hours with a good head of gas. Hole filled with oil to a point where a slopover flow was reported at about the time that casing was ready to be cemented.

(Continued on page 140)

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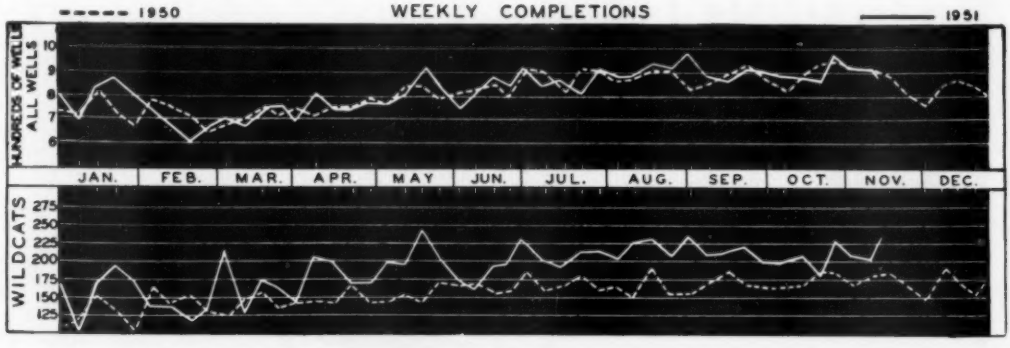
CURRENT STATISTICS

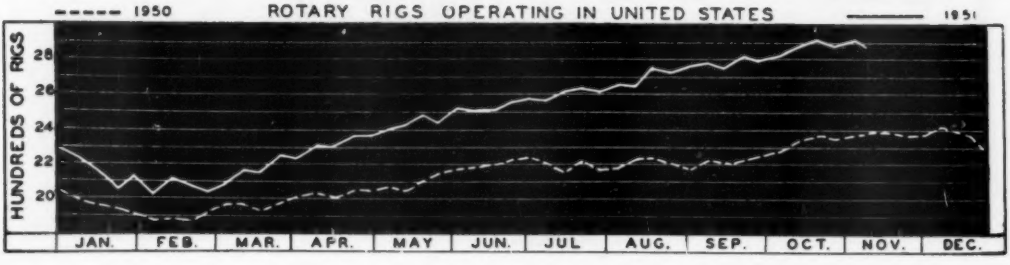
EXPLORATION

WEEKLY WELL COMPLETIONS . . . . WEEK ENDED NOVEMBER 17, 1951

	Total of all wells					Nov. 17		Wildcat completions and discoveries									
													Cumulative total, 1951				
	Comp.	Oil	Gas	Dry	Footage	1951	1950	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	12	7	0	*5	17,616	569	622	0	0	0	0	0	0	0	0	0	0
Pennsylvania	23	7	7	†9	38,620	1,283	1,223	0	0	0	0	0	0	0	2	2	4
West Virginia	14	0	9	5	40,666	547	569	0	0	0	0	0	0	0	7	4	11
Ohio	22	5	5	‡12	43,452	865	924	0	0	0	1	1	1	0	6	26	33
Indiana	31	11	0	20	55,703	1,202	1,427	1	0	0	14	15	57	0	2	430	489
Kentucky	40	10	13	17	83,559	1,124	1,029	1	0	1	3	5	36	0	2	199	237
Illinois	46	21	0	25	125,575	2,084	2,524	2	0	0	9	11	84	0	0	649	733
Michigan	14	3	0	‡11	34,324	674	803	0	0	0	5	5	16	0	6	282	304
Kansas	90	47	1	42	308,539	3,889	3,496	3	0	0	18	21	180	1	12	780	973
Nebraska	5	2	0	3	24,540	208	104	1	0	0	1	2	16	0	2	101	119
Oklahoma	112	69	5	‡38	474,022	4,945	4,784	7	0	0	22	29	165	5	21	644	835
Texas	317	174	18	125	1,512,481	14,683	14,595	25	2	6	74	107	665	51	113	3,032	3,861
North Central (Distr. 7-B & 9)	87	43	1	43	267,690	4,460	4,441	12	0	0	28	40	325	3	15	1,297	1,640
West (Dist. 7-C & 8)	92	72	1	19	545,231	4,485	4,404	6	0	1	10	17	165	10	8	569	752
Panhandle (Dist. 10)	10	2	7	1	32,183	637	803	0	0	0	0	0	2	0	0	26	28
Eastern (Dist. 5 & 6)	18	4	1	13	106,224	1,038	1,014	0	0	0	7	7	9	9	2	207	227
Gulf Coast (Dist. 2 & 3)	49	25	6	18	304,860	2,032	2,041	1	1	4	9	15	84	20	55	420	579
Southwest (Dist. 1 & 4)	61	28	2	‡31	256,293	2,031	1,892	6	1	1	20	28	80	9	33	513	635
Louisiana	44	22	3	19	273,946	1,920	2,171	0	0	0	9	9	40	10	7	260	317
Northern	28	15	0	13	110,202	1,058	1,169	0	0	0	6	6	13	0	4	155	172
Southern	16	7	3	6	163,744	862	1,002	0	0	0	3	3	27	10	3	105	145
Arkansas	8	7	0	1	35,450	373	360	0	0	0	0	0	15	1	2	75	93
Mississippi	8	2	0	6	69,401	321	277	1	0	0	4	5	14	4	0	126	144
Southeastern States	0	0	0	0	0	46	52	0	0	0	0	0	1	0	0	18	19
Montana	18	10	1	7	54,648	207	244	0	0	0	2	2	0	0	1	33	34
Wyoming	10	3	1	6	64,226	672	522	0	0	0	4	4	14	0	1	99	114
Colorado-Utah	9	4	0	5	35,293	269	94	0	0	0	2	2	9	0	6	121	136
New Mexico	17	9	3	5	93,424	613	541	0	0	0	5	5	13	0	9	72	94
California	54	42	2	10	215,701	2,058	1,586	1	0	0	9	10	52	0	4	409	465
Miscellaneous (Md.)	2	0	0	2	8,916	71	50	0	0	0	2	2	1	0	21	49	71
Total United States	896	455	68	373	3,327,156	38,621	38,017	42	2	7	184	235	1,379	72	224	7,411	9,086
Total previous week	905	478	70	357	3,556,185			35	0	1	165	201	1,337	70	217	7,227	8,851
Total November 17, 1950	885	493	46	346	3,315,694			30	3	5	146	184	999	68	188	5,747	7,002

Service wells included: *5, †8, ‡1.





DAILY AVERAGE PRODUCTION FOR WEEK

	Nov. 17 crude oil	B. of M. Nov. demand	Nov. 10 crude oil
Alabama	2,850	2,400	2,600
Arkansas	76,550	85,000	76,650
California	985,600	983,000	984,800
Colorado	75,450	75,000	77,300
Eastern	54,125	61,000	61,500
Florida	1,625	1,600	1,625
Illinois	161,300	161,000	163,400
Indiana	32,200	31,000	31,600
Kansas	316,600	319,000	304,350
Kentucky	34,600	31,000	34,500
Louisiana	604,075	655,000	603,925
North Louisiana	113,450	.....	113,300
South Louisiana	490,625	.....	490,625
Michigan	33,700	40,000	39,200
Mississippi	96,100	104,000	97,240
Montana	24,100	26,000	24,200
Nebraska	7,750	8,000	7,500
New Mexico	149,725	155,000	149,625
Oklahoma	508,900	527,000	502,500
Texas	2,789,000	2,750,000	2,789,000
Dist. 1 (Southwest)	33,300	.....	33,300
Dist. 4 (Southwest)	255,200	.....	255,200
Dist. 2 (Gulf Coast)	166,500	.....	166,500
Dist. 3 (Gulf Coast)	466,675	.....	466,675
Dist. 5 (Eastern)	54,125	.....	54,125
Dist. 6 (Eastern)	121,900	.....	121,900
East Texas field	277,500	.....	277,500
Dist. 7-C (West)	113,750	.....	113,750
Dist. 8 (West)	975,675	.....	975,675
Dist. 7-B (W. Central)	83,175	.....	83,175
Dist. 9 (N. Central)	158,000	.....	158,000
Dist. 10 (Panhandle)	83,200	.....	83,200
Utah	3,900	5,000	3,700
Wyoming	185,000	190,000	184,500
Total United States	*6,143,150	6,210,000	6,139,715
Change from previous week, up 3,435			
Canada	150,820	.....	117,515

Total U. S. production January 1-November 17 †1,967,710,485 bbl.
Same period last year (crude plus cond.) 1,726,117,175 bbl.

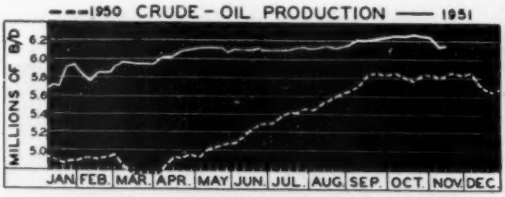
*Not including 110,030 bbl. condensate. †Including 23,804,365 bbl. condensate.

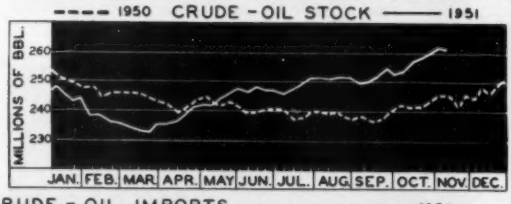
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

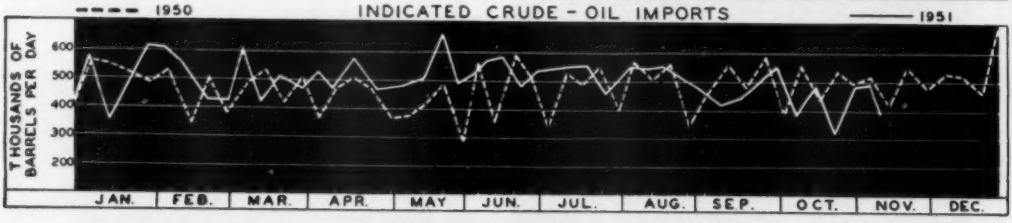
(Thousands of barrels)

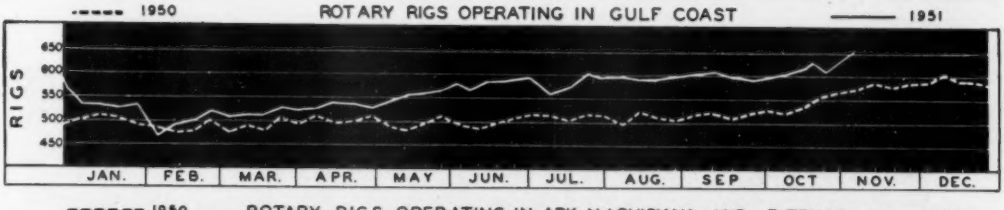
	Nov. 10, 1951	Nov. 3, 1951	Nov. 11, 1950
Pennsylvania Grade	2,003	1,944	2,311
Other Appalacian	1,546	1,668	1,298
Illinois, Indiana, Michigan	12,812	13,064	10,128
Arkansas	2,743	2,705	2,453
Louisiana	14,463	15,124	13,481
North	2,921	2,845	2,809
Gulf	11,542	12,279	10,672
Mississippi	3,472	3,460	1,886
New Mexico	7,187	7,334	6,586
Oklahoma and Kansas	41,014	39,294	37,797
Texas	126,120	126,161	118,638
East Texas	15,679	15,289	14,563
West Texas	53,464	54,464	46,491
Texas Gulf	27,991	27,665	29,100
Other Texas	28,986	28,763	28,484
Rocky Mountain	15,020	15,168	11,465
California	28,798	29,629	30,308
Foreign	6,024	6,610	5,888
Total	261,202	262,161	242,239

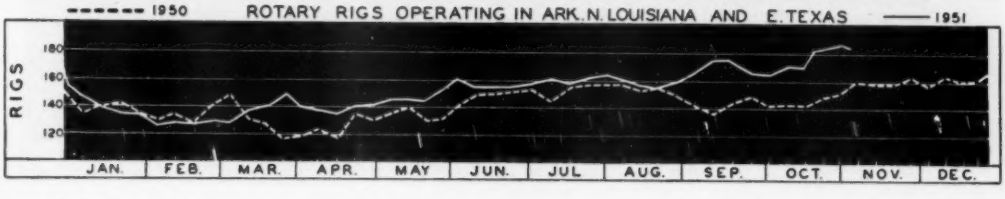
*Bureau of Mines.









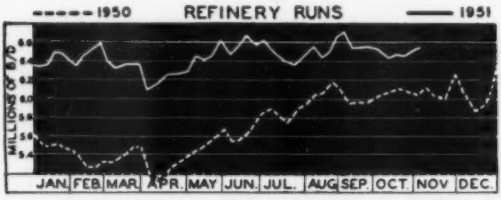

1950 ROTARY RIGS OPERATING IN ARK. N. LOUISIANA AND E. TEXAS 1951
RIGS
180
160
140
120
JAN. FEB. MAR. APR. MAY JUN. JUL AUG. SEP. OCT. NOV. DEC.

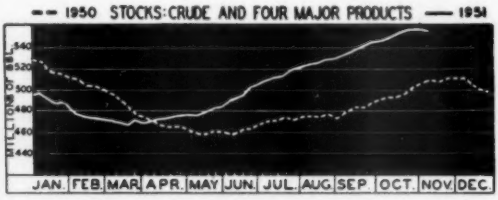
A.P.I. REFINERY REPORT, NOVEMBER 10

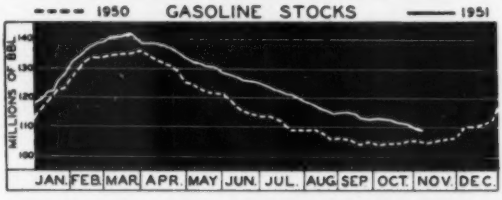
(Thousands of barrels)

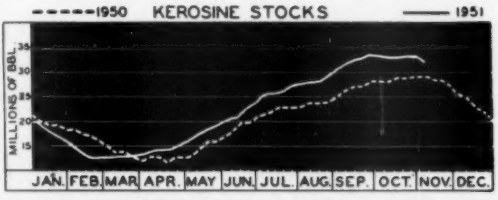
District—	Daily avg. crude runs	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, November 1950				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	1,030	386.6	49.8	274.9	240.7	23,677	11,594	35,672	12,064	903	337.6	31.1	232.7	202.4
Appalachian:														
District 1	96	44.4	5.6	15.0	11.9	2,640	600	962	626	103	40.5	6.1	12.9	12.0
District 2	77	28.0	7.4	7.9	16.0	1,185	414	323	280	65	29.9	4.3	6.8	14.4
Ind., Ill., Ky.	1,222	652.0	79.7	198.4	184.0	23,479	7,181	21,528	6,494	1,125	600.0	69.8	187.7	170.2
Okla., Kans., Mo.	484	270.0	14.4	115.2	60.6	11,278	1,933	11,549	2,155	503	276.7	17.2	105.1	60.2
Inland Texas	248	178.9	12.1	35.1	38.4	3,723	670	2,053	1,357	212	151.3	11.8	34.1	40.3
Texas Gulf Coast	1,569	709.1	150.7	353.7	268.1	17,347	5,499	14,795	7,270	1,456	677.2	119.6	337.1	261.3
La. Gulf Coast	540	243.9	72.3	108.4	51.1	6,021	3,455	3,838	2,148	489	221.6	57.3	107.2	62.4
N. La. and Ark.	83	35.1	6.9	21.4	9.4	2,727	745	1,374	241	75	29.3	6.3	17.4	7.6
Rocky Mountain:														
New Mexico	15	8.7	.	2.9	3.9	119	....	91	35	13	7.4	.3	2.4	3.2
Other Rocky Mtn.	208	98.9	6.9	44.1	41.9	3,180	332	1,790	970	205	93.5	7.0	38.7	47.2
California	1,001	423.3	4.6	163.0	370.6	14,079	484	8,712	14,460	936	394.2	9.0	135.6	358.9
November 10, 1951	6,573	3,069.9	410.4	1,340.0	1,296.6	109,455	32,907	102,687	48,100	6,085	2,859.2	341.8	1,217.7	1,240.1
November 3, 1951	6,543	3,151.0	391.0	1,318.0	1,256.0	109,513	33,522	‡103,177	48,570	.....	.....	.....	.....	.....
November 11, 1950	6,018	2,780.9	317.1	1,209.4	1,240.3	105,465	29,003	86,721	45,408	.....	.....	.....	.....	.....

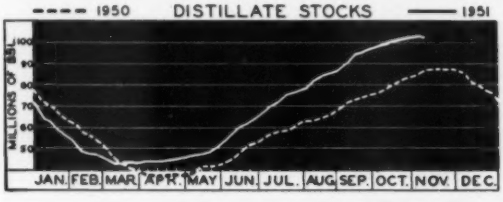
*At refineries including natural blended. †Finished and unfinished. ‡Revised.

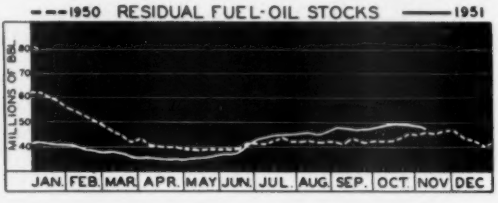


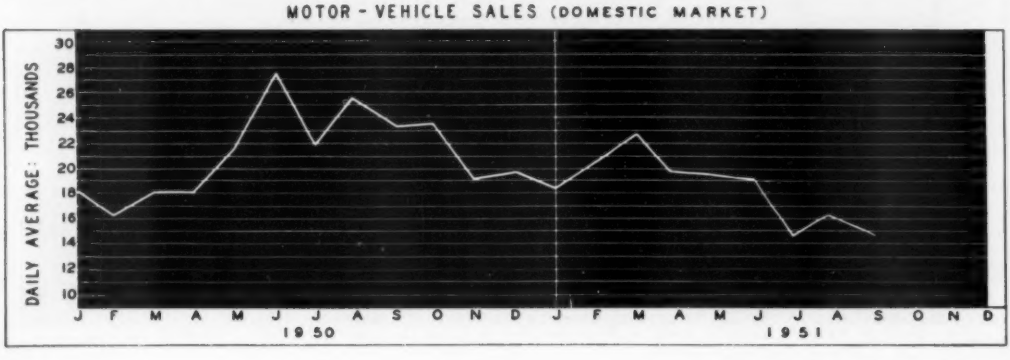












CRUDE PRICES

GRAVITY SCHEDULE

	Signal Hill, Calif.‡	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex†
18-18.9	$1.93	....	....	....
19-19.9	1.98	....	....	....
20-20.9	2.03	$2.25	....	$2.12
21-21.9	2.07	2.27	....	2.14
22-22.9	2.12	2.29	....	2.16
23-23.9	2.18	2.31	....	2.18
24-24.9	2.24	2.33	$2.56	2.20
25-25.9	2.30	2.35	2.58	2.22
26-26.9	2.36	2.37	2.60	2.24
27-27.9	2.41	2.39	2.62	2.26
28-28.9	2.46	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.57	2.45	2.68	2.32
31-31.9	2.62	2.47	2.70	2.34
32-32.9	2.68	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

‡Standard Oil Co. of California.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.80
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	4.25
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37-37.9°. †35° and above.

REDUCTION in the Texas allowable for December will result in a moderate draft on crude stocks for that month. Current production of crude and field condensate is averaging about 6,210,000 bbl. daily. Crude imports are running about 450,000 bbl. for a total new supply of 6,660,000 bbl. daily. Crude exports, transfers, and losses will amount to about 110,000 bbl. daily, leaving 6,550,000 bbl. daily for refinery runs. Refinery use during November may be slightly greater than 6,550,000 bbl. daily with the difference coming from storage. Runs averaged 6,572,000 bbl. daily for the week ended November 10.

Production in December may be down as much as 60,000 bbl. daily from the November average. Also, refinery runs normally increase in December to meet seasonal increases in fuel demand. The gain next month will depend on the movement of distillate and residual fuels out of primary storage in the latter part of November and in the first half of December. Normal weather conditions in December will permit an increase in runs of about 100,000 bbl. daily. If crude imports are held to about the current rate, crude stocks will be reduced about 5,000,000 bbl.

The Office of Price Stabilization seems to have postponed action on the proposed increase in distillate price ceilings for the East Coast until shortages for the area are definitely indicated. As long as almost all primary storage is filled, an increase in price ceilings would not necessarily result in a corresponding increase in price. However, spot tanker rates continue at about Maritime Commission base plus 150 per cent, and rates on charters for longer periods indicate that spot rates will be higher during the winter months. It will take more than a 0.5 cent increase to keep spot cargo buyers in the market.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of November 19, 1951. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10¼-10½	12-12.75	10¾-11
Premium gasoline, 86-88 octane	11¼-11½	13.5-13.75	11¾-12
42-44 w.w. kerosine	9-9¾	10	9
No. 2 straw fuel oil	8¼-8½	9	8
No. 6 residual	$1.65-1.75	$2.45-2.60	$1.75-1.90

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	6⅞	6¾	6¾
Grade 18-55	8.25	7.75	8.0

LUBRICATING OILS

South Texas

300 vis., No. 2-3 neutral	13-13.5
750 vis., No. 3-4 neutral	16
2,000 No. 5-6 neutral	18-19

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	29-30
200 vis., No. 3 neutral, 0-10 pp.	17.5-18.5

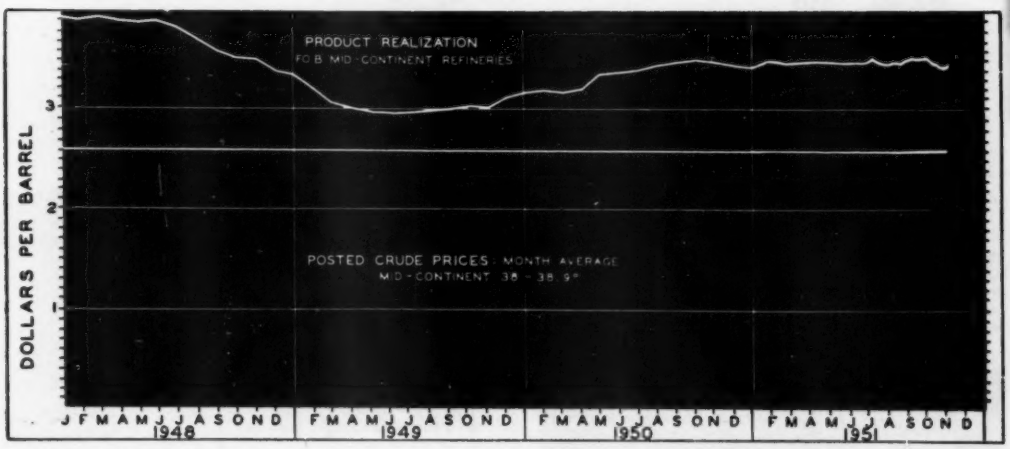
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	32.5
180 vis., 0 p.t. neutral	31.5

WAX

Mid-Continent

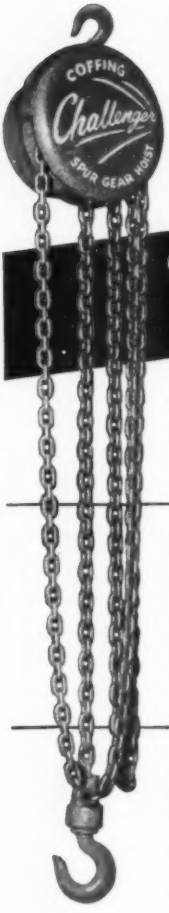
132-134 A.M.P.	5.5



In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.45 for week ended November 10, $3.42 for previous week, and $3.50 for November 1950.

NEW

Coffing Challenger



What you have been waiting for in a Spur-Gear Hoist

Light Weight

Carry it with one hand. One-ton model, with coil chain for standard lift of 8 ft., weighs only 38 lb.

Ruggedly Dependable

Use it year after year. Long life is built in . . . sealed in. Housing is formed steel plate — will not crack under sudden shock loads. Back plate is laminated for extra rigidity. Hoist mechanism has sealed-in lubricant.

Safe

Trust it to protect men and equipment. Tested at 100 percent overload. All load-holding parts are special alloy steel. This hoist actually has a five-to-one safety factor.

Economical

Service it yourself. The Challenger may be completely disassembled in minutes with simple tools. No lost travel time to and from the factory for repairs.

Find out more about the all-new Coffing Challenger, available in ½- and 1-ton capacities. Write for Bulletin F11C.

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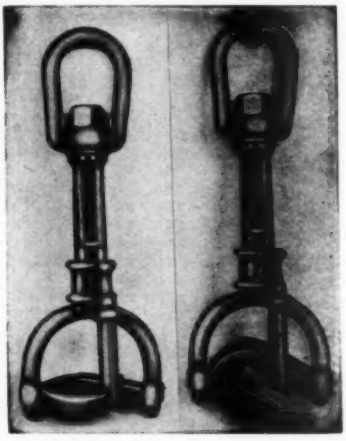
Danville, Illinois

QUIK-LIFT ELECTRIC HOISTS • HOIST-ALLS • RATCHET LEVER HOISTS • MIGHTY-MIDGET PULLERS • DIFFERENTIAL CHAIN HOISTS • LOAD BINDERS • I-BEAM TROLLEYS

NORRIS BROTHERS IMPROVED SAFETY SUCKER ROD ELEVATOR



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Manufacturers of a complete line of wheel-type measuring instruments.

Records to 100,000 ft., repeats cycle. Weighs 5 lbs. Ruggedly built to give years of hard field service. Smaller and larger models available.

EQUIPMENT MEN . . . in the News

Harvey Returns to Cardwell Home Office

Arthur (Pat) Harvey, vice president in charge of export for Cardwell Manufacturing Co., Inc., will move to

ARTHUR HARVEY

W. E. VOLKMAN

the home office at Wichita December 15.

Harvey has been in charge of Cardwell's export division in New York City for the past 6 years and will continue in the same capacity in the Wichita office in addition to other executive duties.

W. E. (Bill) Volkman, who has been stationed at the Wichita office as assistant to Harvey, will move to Cardwell's export office in New York City.

Atlas Exploration Uses Field Demonstration Truck

Atlas Exploration Co., Houston, is the manufacturer of a field-demonstration truck which is equipped with various types of gas-detecting units for use in preventing explosions in industry, and a calibrating device by which gas detectors can be calibrated under actual working conditions.

Instruments include a portable model probetector, a lightweight, portable unit commonly used for determining explosive possibilities of gases in any location by sampling gas with a special probe-head; an alarm model; a model for detecting hydrocarbons on drilling rigs for use by geologists and safety engineers; a model for testing drilling mud samples; and a model for detecting gases on boats. These instruments give instantaneous reading in the lower explosive range of gases. They are precision built with patent applied for elements. Portable models have self-contained batteries and others operate from any 6-volt source.

Field demonstration truck which is being used throughout the Gulf Coast in the petrochemical industry.

Wilson Construction Names Busch Chief Engineer

P. E. Busch has been named chief engineer for C. E. Wilson Construction Co., Houston and Kansas City.

Busch for the past 2 years has been assistant superintendent of measurement for Texas Eastern Transmission Corp., Shreveport, and prior to that time was chief corrosion engineer for Great Lakes Pipeline Co. at Kansas City.

Elliott Joins Butler As Sales Representative

J. S. ELLIOTT

G. A. Burns, vice president and manager of the oil-equipment division of Butler Manufacturing Co., Kansas City, has announced the appointment of J. S. (Spence) Elliott as sales representative in eastern Missouri and southern Illinois.

Elliott comes to Butler from A. E. West Petroleum Co. in St. Louis where he had been branch manager for 4 years. His experience in the oil industry includes a 12-year tour of duty with Mid-Continent Petroleum Corp., Tulsa, where he served as territory manager in charge of sales and operations for the Missouri area.

Barnebey Establishes Chemical Process Firm

H. L. Barnebey, formerly sales-promotion manager and chlor-alkali department manager for Blow-Knox Construction Co., has established his own business in Pittsburgh for the selection, evaluation, and licensing of important chemical and petroleum processes.

Hobbs Begins Production In New Trailer Factory

M. J. NEELEY

Production lines of various types of Hobbs truck trailers and truck bodies are moving through Hobbs Manufacturing Co.'s new factory building recently dedicated in Fort Worth. The new Hobbs trailer factory covers an entire city block and increases manufacturing space to 30 times the size

W. E. GRACE

E. L. PARRIS

of the company's original 50 by 125-ft. tin building.

Executive officers of the company are: M. J. Neeley, president and treasurer; W. E. Grace, vice president and general manager, and Ed L. Parris, sales manager.

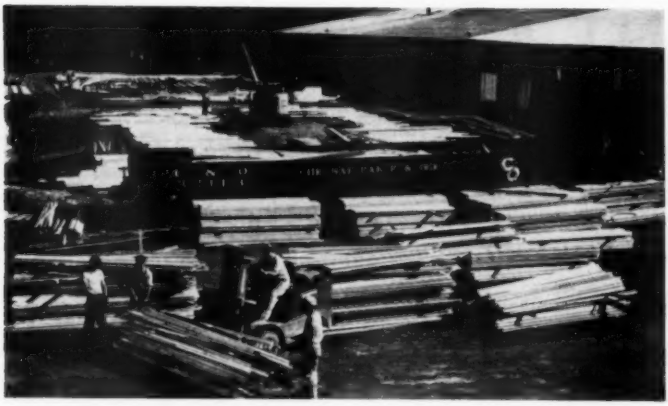
In addition to its general offices and factory in Fort Worth, Hobbs operates factory branches in Houston, San Antonio, Dallas, and Lubbock.

Cabot Carbon Co. Honors Neely at Employe Banquet

F. M. (Steve) Neely, superintendent of Cabot Carbon Co.'s natural-gasoline division in West Texas, was honored at a banquet in Odessa November 7 along with all employes of its Walton gasoline plant near Kermit, Tex.

The Cabot plant, which produces some 65,000 gal. of natural gasoline, propane, and butane daily, has operated more than 10 years without a lost-time injury. Hugh Burdette, vice president and general manager of Cabot operations in the Southwest, praised the employes for this outstanding operating record.

Don M. Conley, safety and insurance director, arranged the banquet program, and E. L. Green, vice president in charge of oil, gas, and gasoline, made the presentations.



Boyles Galvanizing plant at Tulsa.

Boyles Expands Galvanizing Output

In commenting upon the 1,400 tons of material being galvanized for defense purposes in its Tulsa plant, W. M. (Pat) Boyles, president of Boyles Galvanizing Co., stated that a recent study indicates that the use of galvanizing for the oil and gas industry has multiplied four times in the last 10 years.

Among the oil-field material being galvanized by Boyles are bolted tanks, rig parts, crow's nests, substructures, pipe racks, loading racks at refineries, fittings, flanges, heat exchangers, and other equipment and supplies.

The Boyles company was established at Tulsa in November 1949. The company is galvanizing steel fabricated by steel plants in Tulsa and elsewhere. The company is shipping to export markets and is expanding its plant facilities to include a chrome-plating plant to serve the oil industry, national defense, and defense-supplying industries, according to W. A. Brown, vice president.

Eastman Names Cook Gulf Coast Manager

W. H. COOK

W. H. (Windy) Cook has been appointed Gulf Coast division manager for Eastman Oil Well Survey Co. at Houston, according to an announcement from Denver by H. John Eastman, president.

Cook has been associated with Eastman since 1938, and was formerly Gulf Coast division sales manager. He is a graduate of Rice Institute, and is well known throughout the oil fraternity in the Gulf Coast area.

J. C. (Hap) Staton, who has been associated with Eastman's Gulf Coast division for the past 10 years, will continue in his present position as general field superintendent.

Whitney Appoints Beder General Sales Manager

H. W. BEDER

Winthrop H. Whitney, president of Whitney Chain Co., Hartford, Conn., has announced the appointment of Harold W. Beder, Jr., as general sales manager.

Beder was formerly associated with McKinsey Co., Management Consultants, New York, as market research specialist. Prior to this he was affiliated with Proctor & Gamble as a member of its marketing division.

Koons Joins Refinery Engineering at Tulsa

D. O. Givens, vice president in charge of engineering, Refinery Engineering Co., Tulsa, has announced that Harold F. Koons has joined the organization in the capacity of project engineer.

Refinery Engineering is engaged in the design and construction of oil refineries. Koons has been identified with the oil industry for the last 10 years. He spent 7 years with Jones & Laughlin Supply Co., at Tulsa, in its engineering and construction division, as a process and mechanical engineer. More recently, Koons has been employed as a refinery engineer with Derby Oil Co. of Wichita, Kans.

Homestead Appoints New Division Sales Manager

Homestead Valve Manufacturing Co., Coraopolis, Pa., announced the appointment of G. R. (Dick) Olsen as division sales manager in the states of Washington, Oregon, California, Idaho, Nevada, Utah, Montana, Wyoming, and Colorado.

Prior to joining Homestead Valve, Olsen represented W. R. Ladewig Co., Los Angeles; 3 years as a manufacturers' representative, and 16 years with General Petroleum Corp.

Olsen will make his headquarters in Los Angeles.

GM Diesel Training Unit Available in Canada, Mexico

On-the-job training in the operation and maintenance of diesel engines offered by the Detroit Diesel Engine Division of General Motors has now been made available to diesel owners and operators in practically all parts of the North American Continent.

The newest addition to the fleet of mobile training schools originally sponsored by the division has just been dispatched to its first assignment near Alberta, Canada. With another unit recently installed in Mexico, these new additions bring the total number of mobile diesel-training schools operated by General Motors to a total of 9 units.

The schools have been held in the field on projects where diesel-powered equipment is being operated and also in the establishments of GM diesel and GMC truck distributors and dealers throughout the country. The new Canadian unit, cosponsored by the Diesel Division of General Motors Products of Canada, Ltd., has a schedule that will take it from coast to coast in the next 13 months.

GM diesel mobile training unit is unloaded for 2-day session at headquarters of Morrison-Knudsen Co., Inc., Boise, Idaho.

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UNDISPLAYED CLASSIFIED 15c a word one issue. 10% Discount three or more issues. $3.00 minimum charge. Blind Box in our care counts nine words. Payable in Advance.

EQUIPMENT FOR SALE

FOR SALE: Seamless casing and tubing new and second hand. Phone Rogers Pipe and Supply Co., Tulsa, Okla.

FOR SALE: One Bucyrus-Erie 36 L Spudder three and one-half years old. Complete top and bottom tools 15½ to 5½. Also complete tailing in tools. All in first-class condition. List on request. J. E. Griggs, 310 East Third St., Mt. Carmel, Illinois. Phone 959.

NEW Seamless Line Pipe—1500 metric tons 2.375" o.d. and 4½" o.d. to API specifications. New welded Line Pipe—6000 metric tons 20" to 30" API monogram and to API specifications. New Welded Line Pipe—4½" up to API specifications. Box E-443, The Oil and Gas Journal, Tulsa, Oklahoma.

SPUDDERS, BUCYRUS, Wichita, Fort Worth, also rotaries and core drills. Good used equipment, tools, pipe, cable. Everything for well drilling. Fishing tools rented. Pressey & Son, Pueblo, Colorado.

FOR SALE: "300-A" Sullivan drilling rig, 65' derrick, 2-Buda L-525 motors compounded, 7x10 Mud pump, all mounted on tandem trailer. 3,000 ft. of extra good 3½ EUE drill pipe, 6.6" drill collars, tongs, kelly, swivel, pipe racks, dog-house, Kohler light plant. Complete rig now working on 2,700 ft. wells in West Texas. Price complete with C-50-T Autocar truck to pull rig $38,000.00. Del Rio Drilling Company, P.O. Box 1022, Del Rio, Texas.

FOR SALE

10,000—6⅝" OD 8 Thread Standard Recessed Line Pipe
Couplings at $1.50 each.

3,000—8⅝" OD 8 Thread Standard Recessed Line Pipe
Couplings at $2.25 each.

All couplings are clean and in perfect condition.

OIL FIELD SALVAGE COMPANY
Breckenridge, Texas
Phone 232 P. O. Box 812

IMMEDIATE SHIPMENT
KILNS—COOLERS—DRYERS

1106-35 Roto-Louvre.
8'x125'x⅝" Bethlehem Fdry.
8'x100'x⅝" Bethlehem Fdry.
8'x80'x½" Bethlehem Fdry.
7'x60'x⅜" with lifters.
6'x14'x9/16" Struthers-Wells (2—NEW)
5'x67'x5/16" with lifters.
4'x34'x5/16" Struthers-Wells.
4'x25'x5/16" brick-lined.
4'x16'x⅜" Iowa with burner & stack.

HEAT & POWER CO., INC.
70 Pine St., Hanover 2-4890, New York 5
Machinery & Equipment Merchants

EQUIPMENT FOR SALE

FOR SALE: Redwood Oil Tanks. One six hundred barrel. One 500 barrel. One three hundred barrel gun barrel. Two two hundred and fifty barrels. One one hundred barrel. Call or write P. C. Dressler, McLouth, Kansas.

GIGANTIC WAR SURPLUS—EXCESS INVENTORY SALE. Savings to 70%. Engines, A-C generators, welders, winches, air compressors, water pumps, electric saws, binoculars, many other items. Freight prepaid. Write sale catalog. Burden Sales Company, 892 "O" Street, Lincoln, Nebr.

Gaso Duplex 4½" x 6" Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units

H. H. COFFIELD
Attn.: W. H. ORR
Phones: 121—Rockdale, Texas
AT-3427—Houston, Texas

EQUIPMENT FOR SALE

ONE portable Franks Spudder, complete with 5" tools, some 7" tools and all tubing and rod tools. Priced to sell. Sole Drilling Co., C/o W. F. Banks, Box 297, Ellinwood, Kansas. Phone 106.

FOR SALE: Mayhew 2000 drill. Has dug 15,000 ft. of hole. This rig like new. Price $5,000 under new price. Special slips, special weight indicator, sand line drum, new 327 cu. in. 145 HP Ford industrial auxiliary motor. Drill also operates from truck motor. Mounted on 6x6 GMC. Clemens Exploration, Princeton, Ind.

FOR SALE

1 Good Used 136' Ideco Derrick with Substructure and #350 Oilwell 6 Sheave Crown. Almost New. Priced for Quick Sale.

BEACON SUPPLY COMPANY
Box 398, Pampa, Texas Ph. 3377

DESIRABLE PIPE AND CASING FOR SALE

CASING:

50,000' 2⅜" O.D. 4# Used Lapweld Range 1 11½ V-Thread Tubing.
20,000' 5½" O.D. 14# Good Used Lapweld 11½ V-Thread Casing.
10,000' 7" O.D. 17# Good Used Lapweld Range 1 10 V-Thread Casing.
5,500' 8⅝" O.D. 24# Good Used Lapweld 8 V-Thread Casing.

LINE PIPE:

3,000' 5" O.D. x .250" Wall New Seamless, P.E., Random Lengths.
4,700' 6" O.D. x .134" Wall New Electric Weld, 8.99#, P.E., 20' Lengths, Tested 807# P.S.I.
10,000' 8" O.D. x .134" Wall 12# New Electric Weld, P.E., 20' Lengths, Tested 605# P.S.I.
12,000' 10" O.D. x .134" Wall 14.87# New Electric Weld, P.E., 20' Lengths, Tested 484# P.S.I.
5,000' 12" O.D. x .250" Wall Used Pipe, 40' Lengths, Two Joints Welded.
34,000' 20" O.D. x .281" Wall 59.00# Used Welded Line Pipe, Excellent Condition.
1,900' 24" O.D. x .312" Wall 79.05# New Electric Weld Pipe, 40' Lengths.
1,600' 26" O.D. x .260/.300" Wall 75.82# New Electric Weld, Range 1, Short Joints Welded.
1,900' 26" O.D. x .281" Wall 77.5# New Electric Weld, 40' Lengths.
440' 26" O.D. x .500" Wall 136.17# New Electric Weld, 20'-40' Lengths.
900' 30" O.D. x .344" Wall 118# New Electric Weld, 40' Lengths.
2,200' 30" O.D. x .500" Wall 167# New Electric Weld, 40' Lengths.
5,000' 36" O.D. x .250" Wall 63.5# Used Excellent Grade Riveted Line Pipe (Suitable for low pressure discharge line or culvert pipe).

IMMEDIATE DELIVERY—SUBJECT TO PRIOR SALE

NEW AND USED CASING, TUBING, LINE PIPE & SEAMLESS TUBING

FOR FULL DETAILS, WIRE OR PHONE AT ONCE

A. J. STRUBEL, Broker
4946 Murdoch, St. Louis Mo. SIdney 1791 (Day Phone) HUdson 8152 (Night Phone)

EQUIPMENT FOR SALE

USED rotary and cable tool drilling tools, wire lines, E. A. Kelly, Box 861, Oklahoma City. Phone 5-6407.

FOR SALE: Almost new 24L Bucyrus Spudder. Inventory on request. S. A. Walker, Box 17, Springerville, Arizona.

PIPE: Casing, line pipe and tubing. Pumping units, gasoline engines, electric motors, and oil field equipment. Tulsa Supply Company, Box 294, Tulsa, Oklahoma.

CUMMINGS Diesel Motor, 150 H.P. in first class condition. Bargain for cash, or will trade part payment on used jackknife derrick. Transco Gas and Oil Corporation, 200 North Third Street, Albuquerque, New Mexico.

BUBBLE TOWERS

1—4′ x 44′ x 112# design pressure w/20 trays on 22″ spacing. 1—4′6″ x 57′ x 55# design pressure w/25 trays on 24″ spacing.

NEWMAN'S INC
P.O. Box 1865—Tulsa, Okla.—Phone 2-5228
Immediate Delivery

We Offer

PRESSURE VESSELS

FOR SHIPMENT NOW

USED CONDITION
CODE CONSTRUCTED BY
A. O. SMITH CORP.

8—10′ ID dia. x 40′ tangent to tangent x 3″ shell. Heads 3⅛″. Test pressure—900 psi. WP—600 psi. All-weld.

8—10′ ID dia. x 40′ tangent to tangent x 2½″ shell. Heads 3″. Test Pressure—750 psi. WP—500 psi. All-weld.

2—8′ ID dia. x 40′ tangent to tangent x 1½″ shell. Heads—1¾″. Test pressure 575 psi. WP—380 psi. All-weld.

8—8′ ID dia. x 40′ tangent to tangent x 2″ shell. Heads 2¼″. Test Pressure 750 psi. WP—500 psi. All-weld.

All vessels located near Chicago, Illinois, and offered subject to prior sale.

Write—Wire or Phone
Howard Kinslow

Kinslow Power & Equipment, Inc.

817 So. Boulder Tulsa 14, Okla.
Phone 5-5914

EQUIPMENT FOR SALE

AS IMPORTERS of Steel we can furnish you with European or Japanese Steel Products of all types. Let us have your inquiries. Hemisphere International Corp., 1404 Hibernia Bank Bldg., New Orleans, La.

FORT WORTH Jumbo Spudder with or without tools. No Engine. Near Oilton, Oklahoma. Just finished 3000 ft. hole. Priced to sell. Doak Drilling Co. Write or Phone, 1579 Bristow, Oklahoma.

WANT TO TRADE: Trailer mounted Rotary, Wilson draw works, 66′ mast, 7¼ x 10 GD Pump. Complete and excellent condition for Rotary suitable for 4000′ drilling or what have you. Box 378, Cherryvale, Kansas.

PIPE LINERS—3800—6″ Short Dresser Couplings w/ Bolts Less Gaskets. 1,500 Available for Immediate Delivery. Printy Pipe & Supply, Cut Bank, Montana.

7500′ of API Full Hole 4½″ Drill Pipe. Graded by Sonoscope engineers. Approx. OD of joints 5½″. $2.50 per ft. Milford Giffin, Giffin Hotel, Hoisington, Kansas.

CARLOAD quantities new and used oil field tubular goods available — PAD required—New casing and tubing—No PAD for line pipe. Send inquiries to Luside Metal Co., Inc., 805 Granite Bldg., Rochester 4, N. Y.

PIPE
All sizes; line pipe and casing, tanks, and oilfield supplies. Edco Pipe & Supply Co., Phones 933 or 1298, Drumright, Okla.

FOR SALE
OIL WELL CASING AND TUBING

6,000′ #1 Used Grade C 5½″ O.D., 14# Seamless 10 V.T., R.1 & 2.

4,000′ #1 Used J-55 14# Seamless 8 R.T., R.2.

4,000′ #1 Used H-40 5½″ O.D., 14# Seamless 8 R.T., R.2.

20,000′ #1 Used 2⅜″ O.D., 4.60# Seamless 10 R.T., 11½ V.T., R.1 & 2.

MICHIGAN CARLON PIPE COMPANY
20050 Livernois Avenue, Detroit 21, Mich.
Diamond 1-1400

2″ NEW STANDARD BLACK PIPE

35,000 feet T & C
45,000 feet—Plain End
Available for immediate shipment

2,000 feet
New 26″ O.D. .281 wall
40 foot lengths
Immediate delivery
Subject to prior sale

Write—Wire—Phone

SONKEN-GALAMBA CORPORATION
2nd and Riverview (X-781)
Kansas City 18, Kansas
THatcher 9243

EQUIPMENT FOR SALE

FOR SALE: 87 ft. telescoping rotary drilling mast complete with steel sub base. Terms. Melton Supply Company, Seminole, Oklahoma.

FOR SALE: One super model Wilson single drum servicing unit, 80 hp. Waukesha 4,000′ wire, all tubing tools, mounted on GM 4-wheel drive truck. $3500. Phone Rogers Pipe and Supply Co., Tulsa, Okla

1950 SPARTAN 33½ ft. Royal Mansion, with ¾ ton Philco Airconditioner. Never been used on road. In first-class condition. Hylander Cafe, 2701½ Drexel, Houston, Texas.

PIPE FOR SALE: 7,000 ft. of 6¼ I.D. Casing—13 lb. Good threads and collars. 5,000 ft. 5⅝ Casing, good threads and collars. 7,500 ft. 6 in. O.D. line pipe. 1,000 ft. of 3 in. heavy casing, good collars and threads. 14,000 ft. of 4 lb. heavy and good 2 in. tubing. Allen Gas Corporation, Paola, Kansas.

SLIGHTLY USED: 1—Model T-380 7½″-X 12″ Clark Ideco Triplex Slush Pump, 380 H.P., 800# P.S.I., 805 GPM at 65 S.P.M., Fluid End 3500# WP Suction 1500# WP. Wt. 30500#. Excellent Condition. Price F.O.B. Odessa, Texas, $8500.00. H. A. McCarthy, 310 Thompson Bldg., Tulsa, Okla.

EQUIPMENT WANTED

WANTED: Complete portable or semiportable gasoline plant to handle two million feet per day, 300 pound discharge pressure. Also direct driven 600 HP compressor. Box E-450, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED TO BUY: Approx. 1,000 Ft. of New 8⅝″ Seamless ⅜″ Wall, 33# Per Ft. Approx. 750 Ft. 24″ O.D. ½″ Wall Seamless Sch. 30. Friedman Iron & Supply Co., Box 4247, Fort Worth, Texas. FO-4095.

WANTED: Lee C. Moore 87′ mast and sub base complete. Have 66′ trailer mounted mast for sale or trade. Box 378, Cherryvale, Kansas.

WANTED TO SWAP: We have large stock Brand New 6⅝″, 8⅝″ and 10¾″ O.D., A.P.I. 8-Round Thread Regular and Long Seamless Casing Collars. Will swap for 7″, 11¾″ and 13⅜″ O.D. New Regular and Long Casing Collars on pound-for-pound basis. What have you? Call, wire or write Centralia Pipe & Supply Co., 218 W. Calumet, Centralia, Ill. Phone 6771.

WE BUY well drilling equipment, machines, cable tools, pipe, etc. Turn your surplus equipment into cash. Pressey & Son, Pueblo, Colorado.

WANTED: Triplex Type Pumps, minimum 500 barrels per day capacity at 1,000 PSI and 0 to 10 PSI suction and up. 1″ Regular Black Line Pipe; 1″ long collar line pipe and 1¼″ upset tubing. Must be in good condition. Lynch Oil Company, P. O. Box 914, Evansville, Indiana.

WANTED FOR CASH

Oil Well Type Motors in ratings 15/30-20/50-25/65 or 35/75 Horsepower. Will buy other type motors.

ALLIED ELECTRIC & MACHINERY CO.
1007 Falls Bldg., P.O. Box 1838
Memphis 1, Tenn.

WISH TO PURCHASE
1950-1951
Bucyrus-Erie Spudder
either a 48-L or 36-L.

KETA GAS & OIL COMPANY
Terminal Building Bradford, Penna.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing. Catalog and Samples on request. Burkhart Printing & Stationery Company, 118 South Cincinnati, Tulsa 3, Oklahoma

FOR SALE
VARIABLE SPEED

PIPE LINE MOTORS
USED BUT IN EXCELLENT CONDITION

IMMEDIATE DELIVERY

5—250 HP, 1—300 HP Elliott Base Ventilated, 3540 RPM, 2300 Volt, 3 phase, wound rotor induction motors complete with necessary controls. For details address inquiries to Box E-462, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

RELIABLE oil company desires thoroughly experienced production superintendent for East Texas oil field. Salary commensurable with that paid by other companies for like work. Reply to: Box E-435, The Oil and Gas Journal, Tulsa, Oklahoma.

RESEARCH Engineer — 26-40 — B.S., and preferably an advanced degree in petroleum or mechanical engineering. Must be widely experienced in well completion practices. Will be responsible for research program in well completion practices and well mechanics. Salary open. Location — Ponca City, Oklahoma. State age, experience, education, and salary desired in opening letter. Write direct to Personnel Records Division, Continental Oil Company, Ponca City, Oklahoma.

KEY Seismograph Personnel Needed by Established and Expanding Seismograph Company. Box E-264, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPANDING program provides excellent opportunity for a few experienced Seismic Party Chiefs for foreign and Canadian assignments. Applicants should have not less than three years' experience in capacity of Party Chief, be proficient in interpretation, and have proven ability to administer crew. Liberal compensation based upon competence. United Geophysical Company, Inc., Bin M, Pasadena 15, California.

WANTED—TRAVELING AUDITOR
Excellent opportunity for auditor who is free to travel. Work requires auditing of oil company records in the United States and Canada. Applicant should be familiar with refinery procedures. Yield clerk and typing experience helpful. Must have automobile. Box E-468, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

WANTED BY SEISMOGRAPH COMPANY
IMMEDIATE EMPLOYMENT
ATTRACTIVE SALARIES
Openings for Party Chief capable of interpretation of seismic data, Computers, Surveyors, Observers, and Shooters. Box E-449, The Oil and Gas Journal, Tulsa, Oklahoma.

RESEARCH Metallurgist—26-40—B.S., and preferably advanced degree in metallurgy or metallurgical engineering. Should have experience with all types of laboratory apparatus for metallurgical study and experience in selecting materials for all types of services. Corrosion studies, materials selection, and anlysis of failures will constitute the bulk of the work. Salary open. Location—Ponca City, Oklahoma. State age, experience, education, and salary desired in opening letter. Write direct to Personnel Records Division, Continental Oil Company, Ponca City, Oklahoma.

WANTED: Engineer with natural gasoline plant or recycle plant experience in process design. Location, Fort Worth office of expanding progressive independent oil company as assistant to Chief Engineer. State salary expected. Give experience, age, family, etc. Information held confidential. Box E-424, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED—Refinery instrument man. Cat cracking experience necessary. New Mexico Asphalt & Refining Company, P. O. Box 367, Artesia, New Mexico.

EXCELLENT salary and bonus for man capable of running and calculating bottom hole oil samples, recombined surface separator samples of both oil and gas, and distillates and gas. Also need Pod. operator for Oklahoma laboratories. Box E-465, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

NATIONALLY known manufacturer of oil field specialties has opening for commission representative in Michigan, Ohio, Pennsylvania and West Virginia. Products are marketed only through recognized jobbers but contact with both jobber and consumer is necessary. Representative must be of highest caliber and must be well established in area. Box E-431, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE Petroleum Engineer one to three years experience in field and office duties for expanding independent producing company. Successful applicant will headquarter in Houston, but must be free to travel. Excellent opportunity for hard worker. In answer give age, education, experience in detail, marital and draft status and starting salary expected. Box E-461, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Experienced refinery Superintendent for 4000 bbl. plant. Send experience record, salary expected and other details. Box E-459, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST with Masters Degrees having 3 years or under experience. Petroleum Engineers who can go right out and start doing well work. Excellent Employer. Good salaries. No fees. Oil Industry Employment Service, 405 Tuloma Bldg., Tulsa, Okla. 4-5974.

WANTED: Cable tool drillers with big hole experience, who are sober and reliable. We offer permanent jobs with good pay. Layne-Minnesota Co., 3140 Snelling Ave., Minneapolis, Minn. Telephone—Parker 6668.

RESEARCH Group Leader and Research Engineer — 26-40 — B.S., and preferably a Ph.D. in physical chemistry, physics, petroleum engineering, or chemical engineering. Should have experience in reservoir engineering, reservoir mechanics research, or fluid flow research. Will be responsible for research program in multiphase flow and other aspects of reservoir mechanics. Salary open. Location—Ponca City, Oklahoma. State age, experience, education, and salary desired in opening letter. Write direct to Personnel Records Division, Continental Oil Company, Ponca City, Oklahoma.

OPPORTUNITY FOR GEOLOGIST

Large mining corporation, having recently entered oil business, requires geologist, 30 to 35 years, to follow and further its oil interests. Experience Gulf Coast preferable. Headquarters New York City. References must be excellent. Box E-458, Tulsa, Okla.

Important New York investment firm, which has already very substantial oil interests, wants first-class geologist or petroleum engineer with good judgment and aptitude to understand financial aspects of oil business. Would consider applications coming from men having held responsible positions with banks, oil companies or oil consultants. Would pay good salary and good opportunity according to talent. Our staff knows of this offer.

Box E-442
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

GEOLOGIST

with Oklahoma experience wanted by active independent operator. Oklahoma City headquarters. Excellent salary. Outline education and experience in detail. All replies strictly confidential.

Box E-440
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

SITUATIONS WANTED

FORMER Independent Oil Operator ten years, with legal education, plus eight years Wall Street experience, desires connection raise funds exploratory well drilling from excess profits taxpayers. Box E-396, The Oil and Gas Journal, Tulsa, Oklahoma.

CAREER OPPORTUNITY FOR

PIPING DESIGNERS

Work in Southern California

Positions are open in the engineering and design of complete oil-refineries and chemical-plants. Our expanding workload presents opportunities for advancement.

Prefer mechanical engineers with experience in the design and drafting of high-pressure piping.

Please send a detailed summary of your education, experience, and personal history to our Personnel Department. Also include a recent photo of yourself. All replies will be kept confidential.

C F BRAUN & CO

Engineers Fabricators Constructors Consultants

1000 South Fremont Avenue, Alhambra, California

SITUATIONS WANTED

PETROLEUM ENGINEER: 2 years experience in drilling, production, and workover operations; 2 years experience in reservoir engineering and evaluation. Presently employed. Desires to become affiliated with independent operator. Box E-451, The Oil and Gas Journal, Tulsa, Oklahoma.

TWENTY YEARS' experience refinery superintendent and manager. Desire connection with independent refinery. Box E-456, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE Electrical Engineer—Eleven (11) years experience with major electrical manufacturer applying electrical and mechanical equipment, pipelines, refineries and production. Previous distribution and maintenance. Basic knowledge micro-wave and geophysics. Private pilot. Age 37. Family. Desire connection with oil industry administrative engineering capacity. Box E-467, The Oil and Gas Journal, Tulsa, Oklahoma.

GAS ACCOUNTANT, under 40, married, family, experienced all phases gas accounting, measurement, transmission, desires change by January 1. Box E-470, The Oil and Gas Journal, Tulsa, Okla.

CHEMICAL ENGINEER, 2½ years of good general refinery experience. Veteran, 27, family. Presently employed. Desires connection with progressive refining company. Box E-466, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer with six years varied experience in production and drilling operations desires field work with an aggressive independent. Major company for past five years and currently my employer. References. Box E-463, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico Personal interview by appointment is desired. Makin Drilling Company, Box No 131, Ph. No. 131, Hobbs, New Mexico.

FORMER Office Manager-Oil Accountant for large Independent Operator desires connection with Independent. Heavy experience land and lease work. Capable assuming full responsibility. Age 32, marrried, reliable and steady. Appreciate interview. Box E-439, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERT material man offers twenty-six years experience including inventory control, stock analyses, warehousing, purchasing, etc., in both Foreign and Domestic service. Box E-436, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer, married, 4 years experience in production, completion, purchasing, supervising on Gulf Coast and West Texas. Desires change, stateside or foreign. Box 1103, Freeport, Texas.

GEOLOGIST, with extensive experience in oil and gas exploratory work, in foreign as well as domestic fields, for major as well as independent oil companies; doing surface, detail and reconnaissance, and subsurface work. Considerable administrative as well as geological survey experience. Wishes connection or position. Will go anywhere. Box E-425, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE Petroleum & Mechanical Engineer desires domestic or foreign supervisory position in refining maintenance, inspection, Mechanical or operating fields. Age 32, married with children, seven years domestic and Foreign experience refining operation, maintenance, equipment and welding inspection, corrosion engineering, and cathodic protection designing. Box E-453, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST

Twenty-five years experience. Texas-Louisiana Gulf Coast. Subsurface geology and well completions. Interested in position with oil company, independent operator, or drilling contractor-prodtseer. Box E-438, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOPHYSICAL SERVICE

GEOLOGY of the Magic Circle, Daniel E. Willard, Kansas, Nebraska, Iowa, Missouri, Oklahoma; send check $5.00, Magic Circle Educational Foundation, Yates Center, Kansas.

ROYALTIES

MONTANA ROYALTIES
Millions of acres now leased by world's major companies, with huge drilling play in prospect. For booklet describing Montana geology and oil development, write Landowners Royalty Company, Box 1235 Great Falls, Montana.

OWNERS want to sell part royalty 2560 acres Texas; 240 acres Lea County, N. M., lease; 480 acres California lease. C. W. Deming, Waycross, Ga.

LEASE AND DRILLING BLOCKS

INTERESTED in drilling several wells not over 4,000' in North Texas by December 15th. Give complete description and full details, Box 4343, Dallas, Texas.

WILL pay cash instantly for leases (large blocks), royalties, mineral deeds, production. Write fully—P. O. Box 2153, Denver Colorado.

IF INTERESTED in reasonably priced oil and gas leases in Shelby County, Texas, surrounded by major company activity, write me for detailed information. C. A. Parker, Office Polley Hotel, Center, Texas.

2200 ACRES in Tensas Parish. Good oil prospects, fine soil, pasture and timber. Priced with or without minerals. Mrs. Arno Halbfass, Shreveport, Louisiana.

WILL checkerboard 10,000 acres for test well to 4,000 feet in Southwest New Mexico. Excellent Geology, Large Oil Company has leased all remaining acreage, a real hot spot of the future. Box E-464, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Oil and Gas Leases adjoining producing leases, also wildcat leases, drilling propositions and small producing properties; all in shallow territory. W. P. Harley, Bowling Green, Ky.

WE want a good drilling block, some production with proven or semiproven acreage to be drilled preferred, from owner principals. Must be good properties. Texas properties will be given first consideration. Box E-460, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE OR LEASE Illinois oil and gas leases and drilling propositions. Offsets discovery well lease 575 ft. deep in Pennsylvania production good possibilities in deeper formations. Box E-457, The Oil and Gas Journal, Tulsa, Okla.

CAPITAL immediately available for geologically attractive Drilling deals and oil producing properties. Send full particulars. Box E-434, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASES ROYALTIES
Producing and Nonproducing
Bought and Sold—Any Area
Inquiries Invited

B. D. BUCKLEY
6635 Delmar Ave., St. Louis 5, Mo

SERVICES YOU NEED

If you have a producing property, proven or semi-proven leases that you want to sell or have drilled you need a complete detailed reliable report on those properties. **Let us make a survey so you will know what you have,** then you can offer it in a more intelligent manner or we probably could sell it for you if it is good.

FORT WORTH EXPLORATION CO.
Sinclair Building
Fort Worth, Texas

BUSINESS OPPORTUNITIES

THREE Drive In Theaters, $350,000.00. Terms. Sound Investment. Will Stand very Closest investigation. Southwest Texas. Reason for Selling, old Roughneck retiring. Made his. Box E-468, The Oil and Gas Journal, Tulsa, Oklahoma.

OPPORTUNITY in leasing and geophysical surveying. Three thousand dollars required. Address 126 Lester Drive, Orange, California.

LEASE SERVICE

RECORD TAKE-OFF, available. Listing all Oil leases and assignments as recorded in Grant County, at Carson, North Dakota Giving complete information. Also monthly continuations made. Write P. O. Box 344. Carson, North Dakota.

FOR SALE—MAPS

NORTH DAKOTA and South Dakota Base Maps—County outline, Township and Range, location of wells and Operators name with total depths. Oil and Gas Fields. 1" = 8 miles. Price $5.00 each. County Maps: Fee ownership and lease with expiration dates. Scale 1" = 4,000 ft. Northwest Mapping Co., 117½ Fourth St., Bismarck, North Dakota.

NEW Williston Basin Map—Montana, Wyoming, North and South Dakota, North Nebraska, Western Iowa and Minnesota—15 miles to 1 inch—showing all townships and ranges—all wildcat activity in each state—size 42" x 48"—price, paper $10.00, cloth $17.50—address all orders and make checks payable to D. A. Austin Company, Commercial Standard Building, Fort Worth 2, Texas.

Central Area

(Continued from page 129)

Well will be cleaned out and drilled deeper in the Dundee early next week.

This potential new discovery logged Dundee objective at a sub-sea minus of 3,015 ft. structurally flat to 33 ft. higher than correlating control points within a radius of a mile of the test. Top producing wells in the developed Jerome pool are producing from the Dundee with a sub-sea minus of 2,990 ft., while the lowest producers in the pool check in at minus 3,010 ft., but this new test still may be a better than average well for the area on the basis of preliminary information.

The pay section was logged higher in the objective zone than it was found in the older pool, and the porosity appears to be much better than that found in the field. There is still prospect of drilling more pay in this wildcat. All indications are that well is far above the known water-table in the district.

Wildcat was supported by Turner Petroleum Corp. with an acreage contribution and by Cities Service Oil Co. with a dry-hole letter. Cities Service has the largest spread of acreage around the test. Lakeland & Collin's drilling spread is comprised of about 400 acres.

ILLINOIS SUCCESSFUL WILDCATS

Wayne County: Brehm 1 Seifert, NW NW SE 2-3s-9e, IP 35 bbl., O'Hara 3,292-97 ft., TD 3,415 ft. (opens new area east of Goldengate Consolidated pool).

White County: E. F. Moran and John Buchman 1 Zimmerman, SW SW NW 10-5s-9e, IP 18 bbl., Cypress 2,948-66 ft., TD 2,966 ft.

ILLINOIS WILDCAT FAILURES

Clay County: Calvert Drilling, Inc., 1 Kincaid, NW SW SW 7-4n-8e, dry, TD 3,094 ft.

Clinton County: Nash Redwine 1 Schwinn, NW NE NW 15-1s-5w, dry, TD 2,223 ft.

Coles County: Ernest Zinc 1 Dudley, SE SE SW 7-12n-11e, dry, TD 675 ft.

Edwards County: Harris & Woofter 1 Brown, S½ SE SW 10-3s-10e, dry, TD 3,300 ft.

Hamilton County: Stanford Oil Co. 1 Flannigan, SE NW SE 11-4s-6e, dry, TD 3,471 ft.

Marion County: The Texas Co. 1 Hayes heirs, NW NW SW 19-4n-1e, dry, TD 1,771 ft.

Moultrie County: The Texas Co. 1 Frederick-Wabash Unit, SE NE SW 36-13n-5e, dry, TD 3,252 ft.

Wayne County: Nash Redwine 1 Egyptian, NW NW SW 33-2s-6e, dry, TD 3,442 ft.

White County: J. W. Thompson 1 Creek, NE NE SW 14-5s-10e, dry, TD 3,292 ft.

INDIANA SUCCESSFUL WILDCAT

Posey County: Stanford Oil Co. 1 Oeth, NW NW SE 15-7s-13w, IP 30 bbl., Lower O'Hara 2,670-78 ft., TD 2,771 ft. (extension Lamont pool).

INDIANA WILDCAT FAILURES

Daviess County: Cline & Lambert 1 Robinson, NE SW SW 32-2n-9w, dry, TD 1,411 ft.

Art Wilson 1 Haines, N½ NW NW NE 9-4n-7w, dry, TD 1,468 ft.

Fountain County: McFarland & O'Connel 1 Hershberger, NE SW NW 20-18n-8w, dry, TD 1,106 ft.

Gibson County: Burr Lambert 1 Yochum, SE NW SE 20-2s-10w, dry, TD 2,113 ft.

Slagter Producing Co. 1 Miller, NE NE SE 31-2s-10e, dry, TD 2,264 ft.

Knox County: H. G. Breen 1 Pielemeier, W½ NE SW SE 21-1n-11w, dry, TD 2,183 ft.

F. L. Beard 1 Bonewitz, Military Donation 227-2n-8w, dry, TD 1,504 ft.

F. R. Stocker 1 Wonning, Military Donation 163-2n-9w, dry, TD 1,814 ft.

George & Wrather Drilling Co. 1 Like, Military Donation, 171-2n-9w, dry, TD 1,601 ft.

G. C. Parker 1 Pielemeier, Military Donation 105-3n-8w, dry, TD 1,517 ft.

Pike County: Ryan Oil Co. 1 Cole, SWc SE SW SE 20-1n-9w, dry, TD 2,115 ft.

Posey County: Ryan Oil Co. 1 Damm, SE SE NW 16-5s-12w, dry, TD 2,800 ft.

Lynch Oil Co. 1 Wilson heirs, SW NE NE 8-6s-13w, dry, TD 2,893 ft.

Vigo County: Great Lakes Carbon Co. 1 Harlan, NE NE NW 18-10n-9w, dry, TD 2,146 ft.

WESTERN KENTUCKY SUCCESSFUL WILDCATS

Hancock County: Stanford Oil Co. 1 Ashworth-Jackson, 22-P-33, IP 62,000 cu. ft. gas, Salem 1,340-1,402 ft., TD 1,410 ft. (extension Pellville pool).

Muhlenberg County: John Tuttle 1 Hunt, 20-H-31, IP 5 bbl., Hardinsburg 437-55 ft., TD 458 ft. ((extension Hunt School pool).

WESTERN KENTUCKY WILDCAT FAILURES

Daviess County: Stanford Oil Co. 1 Tong, SE NW NE NE 11-N-29, dry, TD 1,701 ft.

Morris Drilling Co. 1 Gregory, 10-P-30, dry, TD 1,573 ft.

EASTERN KENTUCKY WILDCAT FAILURE

Breathitt County: Sun Oil Co. 1 J. H. Russell, Quicksand Creek of Kentucky River, dry, TD 2,267 ft., Weir sand 1,524 ft., Berea sand 1,606 ft., Corniferous 2,029 ft., Big Six sand 2,204 ft.

MICHIGAN WILDCAT FAILURES

Bay County, Pinconning Township: J. O. Mutch 1 Breu, S½ NW SE 25-17n-4e, Dundee 2,786 ft., dry, TD 3,010 ft.

Mecosta County, Chippawa Township: Chapman Oil Co. & McClure Oil Co. 1 Sparks, NE SE SE 15-16n-8w, Dundee 3,905 ft., dry, TD 3,927 ft.

Oceana County, Grant Township: Turner Petroleum Corp. 1 Siebel, SE SE NW 26-13n-17w, Dundee 2,263 ft., dry, TD 2,273 ft.

Ogemaw County, Logan Township: Don Rayburn 1 Tawas Land Development Co., NW NW SW 35-22n-4e, dry in Berea, TD 1,848 ft.

St. Joseph County, Flowerfield Township: P. K. Degenther 1 Smith, SE SW NW 3-5s-12w, Traverse 1,116 ft., dry, TD 1,138 ft.

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Canadian Fields

(Continued from page 129)

Oil firms participating in this venture and extensive holdings in the vicinity that are now being seismographed preliminary to staking a follow-up well site include: Canadian Atlantic Oil Co., Ltd., Hudson's Bay Oil & Gas Co., Ltd., Union Oil Co. of California, Pacific Petroleums, Ltd., Peace River Natural Gas Co., Ltd., Sunray Oil Corp., and Empire Petroleums, Ltd. N. R. Whittal Co. and W. Innes & Associates, both of Vancouver, also have an interest in the well.

CANADIAN WILDCAT FAILURES

Pacific Western-Lake McGregor 1, LSD 13, 7-17-20w4, TD 6,709 ft., dry.

Anchor-Scurry-Explorers-Jupiter 2, LSD 9, 23-76-19w5, TD 7,000 ft., dry.

Imperial-Rat Lake 1, LSD 9, 7-124-18w5, TD 3,713 ft.

Great Plains-Seaboard-Smoky Lake 3, LSD 9, 9-61-19w4, TD 3,205 ft., dry.

Amerada-Crown G-F-23-11, LSD 6, 11-73-26w5, TD 10,590 ft., dry.

Canadian Delhi-Winnifred 4, LSD 12, 4-10-10w4, TD 3,243 ft., dry.

EASTERN CANADA

Announcement has been made by the Newfoundland Provincial Government that drilling operations will be started shortly by an unnamed American company in the St. Barbe district on the west coast. Equipment will be landed at St. Paul's by L.S.T. barge. The operations are part of an industrial-development program sponsored by the provincial government headed by Hon. Joseph Smallwood.

Oil occurrences have been known since 1812, when a man named Parson used oil seeping from Ordovician outcrops as a rheumatism cure. The area, now known as Parson's Pond, has been the scene of the chief development since then. In 1867 a Halifax mill owner named Silver drilled to 700 ft. and struck oil. Between 1839 and 1906 Newfoundland Oil Co. drilled nine wells. Pumping started in 1904, four wells on the west side of the pond aggregating 6 bbl. daily for 2 months. A well east of the pond over a 5-month period averaged 4½ bbl. a day. Pumping production in 1904 totaled around 700 bbl. in 1905 four wells were shot, with largely unsatisfactory results. In 1907-1908, some 900 bbl. were shipped to the gas works at St. John's. Since then only small quantities have been pumped for local use.

According to a 1934 geological-survey report, about 20 wells have been drilled around Parson's Pond, one to 3,500 ft. Gas and oil were struck at 700, 1,040 and 1,230 ft. The oil is brown paraffin-base crude, about 33° Baume. A later geologist reported isoclinal folding and repeated faulting with most of the wells located near the middle of the highly folded series.

In the Port au Port Bay area, petroleum occurrences were first reported in 1874. In 1898, a Mr. Andrews of St. Stephen's, N. B., drilled four wells into the Ordovician, all encountering oil indications but no large commercial production.

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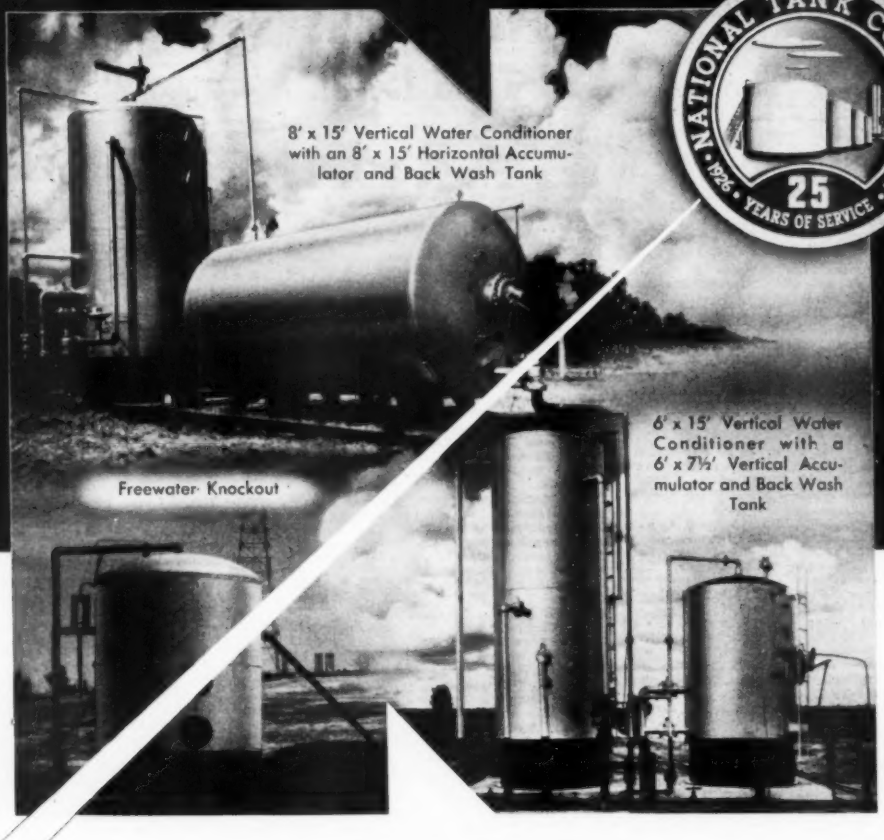
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